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[OFFICIAL NOTICE.]

Report of the Gas Associations Merger Meeting.

Minutes of Meeting of Representatives of the three joint committees appointed by the American, Western and Ohio Gas Associations for the Organization of the American Gas Institute and the merging therein of the three Associations.

By mutual agreement made by correspondence, representatives of the committees appointed at their last annual meetings by

The American Gas Light Association,
The Western Gas Association, and
The Ohio Gas Light Association,

to organize the *American Gas Institute* and merge therein the three above named Associations met for this purpose at the Auditorium Hotel, in Chicago, at 10 o'clock A.M., July 10, 1906.

There were present: Mr. F. H. Shelton and Mr. Wm. McDonald, representing the American Gas Light Association Committee. Mr. K. M. Mitchell and Mr. Paul Doty, representing the Western Gas Association Committee, and Mr. John D. McIlhenny and Mr. Irvin Butterworth, representing the Ohio Gas Light Association Committee.

The Joint Committee organized by choosing Mr. Shelton as Chairman and Mr. Butterworth as Secretary.

Upon assuming the chair, Mr. Shelton stated that the object of the meeting was to carry out the instructions that had been given to the Committee by the three co-operating Gas Associations, namely, to do anything and everything necessary and expedient, in the judgment of the Committee, to the organization of the *American Gas Institute* on the lines laid down by the plans and constitution that had been adopted by the three participating Gas Associations, and to arrange for the first meeting thereof.

Among the matters to be attended to by this Committee at the meeting, the Chairman enumerated the following:

(1) The selection of a time and place for the first meeting of the Institute.

(2) The selection of a Presiding Officer and of an Acting Secretary and Treasurer, to serve until and including the first meeting of the Institute.

(3) The appointment of a Committee of Arrangements for such meeting.

(4) An arrangement for obtaining official lists of the members, in good standing, of the three participating Associations.

(5) The appointment of a Committee on Finances.

(6) The appointment of a committee to design and recommend a permanent badge for members of the Institute.

(7) The appointment of a committee to provide suitable papers to be read at the first meeting of the Institute.

The meeting then being declared formally opened, Mr. McIlhenny presented the following resolution and moved its adoption:

"*Resolved*, that by virtue of the powers conferred upon us by our respective Associations, namely, the American Gas Light Association, the Western Gas Association and the Ohio Gas Light Association, we, the representatives thereof here present, declare that these three Associations do now merge into and form the *American Gas Institute*, the officers of three participating Associations retaining their respective offices until the merger shall become effective, all present salaries to terminate at the time of the first meeting of the Institute."

A vote being taken, the foregoing resolution was declared to be unanimously adopted.

On motion of Mr. Mitchell, Chicago was selected as the place for the first meeting of the Institute, to be held on October 17, 18 and 19, 1906.

As required by the Constitution adopted by the merging Associations, the Committee then proceeded to select, by lot, from the Presidents of the three Associations, a Presiding Officer for the Institute, to serve until and including its first meeting. The drawing was duly made, resulting in the selection of Mr. B. W. Perkins, with Mr. C. F. Prichard as alternate.

After discussion, it was decided to select, also by lot, from the Secretaries of the three participating Associations, an Acting Secretary and Treasurer, to serve until and including the first meeting of the Institute. A drawing was accordingly made, resulting in the election of Mr. Jas. W. Dunbar, with Mr. Geo. G. Ramsdell as alternate.

On motion of Mr. McDonald, seconded by Mr. McIlhenny, the salary of the Acting Secretary and Treasurer was fixed at the rate of $100 per month and expenses, from July 15, 1906, to November 1, 1906, or until he should be replaced by his successor.

On motion of Mr. McIlhenny, Walton Clark, Paul Doty, Irvin Butterworth and F. H. Shelton, as Chairman, were appointed a committee to secure suitable papers for the first meeting of the Institute.

On motion of Mr. Butterworth, it was voted that a Committee of Arrangements be appointed for the first meeting of the Institute, con-

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sisting of three local Chicago men and two representatives from each of the three merging Associations, one being from each of the three committees composing this joint committee, making nine members altogether; and that one feature for the entertainment of the Institute be a first-class banquet, good speakers and a good quartet of singers to be secured therefor, and the use of wines and cigars to be reduced to a minimum. The Chairman appointed as such a committee Mr. Geo. Williamson, Chairman, and Messrs. H. D. Harper, A. B. Eaton, Irvin Butterworth, John D. McIlhenny, W. A. Baehr, Fred Persons, E. G. Pratt and T. C. Jones.

On motion, Mr. Shelton and Mr. McDonald were appointed a committee to design and recommend a permanent badge for members of the Institute.

On motion of Mr. Doty, the Acting Secretary was instructed to notify the President, Vice-President and Secretary of each of the three merging Associations to meet at Chicago on the 16th of October, 1906, as a Governing Board, or Council, to arrange and perfect details for the conduct of the first meeting of the Institute.

On motion of Mr. Doty, the Acting Secretary was instructed to provide for the meeting the door-card system of registration and some suitable plan for the mutual identification of members.

On motion of Mr. McIlhenny, a committee of three was appointed, consisting of Paul Doty, Chairman, and Henry L. Doherty and Donald McDonald (Louisville) to report to the first meeting of the governing body of the Institute, on or before October 16, 1906, on the question of dividing the Institute into sections for different classes of work.

On motion of Mr. Mitchell, the Presidents of the three participating Associations, Mr. Prichard, Mr. Mitchell and Mr. Perkins, were appointed a Committee on Finances.

On motion, it was decided that all libraries, books, apparatus and other property belonging to the three participating Associations be turned over to the Institute as soon as it should establish permanent headquarters.

On motion of Mr. Mitchell, the Acting Secretary was instructed to procure, for the first meeting of the Institute, a Progress Report from Mr. A. E. Forstall, a Report on New Business Methods from Mr. Geo. Williams, and any and all other department and committee reports that were arranged for at their last annual meetings by the three merging Associations, and to notify the Editors of the Wrinkle Departments of the merging Associations to proceed with their work of collecting wrinkles, advertising for them over their joint signatures should they so desire, and submitting their reports to the Institute as one report.

For the benefit of the Finance Committee it was voted as the sense of this committee that no member of two or more of the three participating Associations should be eligible for charter membership in the American Gas Institute, unless his dues for the current fiscal year to each of the Associations of which he is a member shall have been paid in full.

On motion, the Acting Secretary was instructed to have the Gas Institute letter-heads printed at once; to officially, in the name of the Institute, apply to the railroads for 1½ round trip transportation rates for the meeting in October; to have a summary of these minutes printed in the gas journals; to procure certified lists of members in good standing of each of the three participating Associations; to notify members of the Committee on Arrangements of their appointment and duties; and to do any and all other things necessary and within his proper authority as Acting Secretary and Treasurer toward carrying out the plans and arrangements set forth or implied in these minutes, to the end that the Institute may be properly and completely organized and that its first meeting be made a success.

On motion of Mr. Shelton, the Secretary of this committee was instructed to send a copy of these minutes to every member of this committee.

The meeting thereupon adjourned, subject to the call of the Chairman.

IRVIN BUTTERWORTH, Secretary. F. H. SHELTON, Chairman.

BRIEFLY TOLD.

NOTES.—

R. M. SEARLE, of Mount Vernon, N. Y., has resigned from the Westchester Lighting Company to accept the position of General Manager of the Rochester Railway and Light Company, Rochester, N. Y. He goes to Rochester about August 1.

ALBERT J. WEBER, President Adam Weber Sons Company, has received from Herkimer County Light and Power Company for their Ilion and Little Falls (N. Y.) plants orders for Adam Weber gas benches.

THE Natick (Mass.) Gas Light Company put into commission July 13th, their new holder of 100,000-foot pressure double lift resting steel tank 24 by 67 feet built by Davis & Farnum.

[OFFICIAL REPORT—REVISED BY THE SECRETARY—CONTINUED FROM PAGE 100.]

THE TWENTY-NINTH ANNUAL MEETING, WESTERN GAS ASSOCIATION.

HELD IN CLEVELAND, O., MAY, 16, 17 AND 18, 1906.

SECOND DAY—AFTERNOON SESSION.

Mr. Fred B. Wheeler presented the following data to the Committee on Municipal Ownership for their assistance:

MUNICIPAL OWNERSHIP IN MASSACHUSETTS.

It may be interesting to make a study of the growth of the municipal ownership idea in this State during the 11 years, 1894–1904, both inclusive.

The Acts of 1891 and 1893, particularly the former, are the authority for public control of gas and electric properties. Up to January 1, 1894, 40 towns had acted upon the legal permission and had voted pro or con on the matter. On January 1, 1894, only 7 towns were engaged in electric lighting; 1, Middleborough, having a gas annex. During 1894, 3 towns, Hull, North Attleboro and Wakefield, started in, and one of which, Wakefield, had a gas annex. The names of the 7 towns were Danvers, Braintree, Hingham, Middleborough, Needham, Peabody, Wellesley. It will be noted that all of these towns are small in population and area. During the year 1894 6 towns voted for municipal ownership—Arlington, Chicopee, Hull, Marblehead, Medford and Reading.

Five towns voted no. Three postponed action and, as said above, 3 began operations. Of the towns in operation at this time, Braintree, Hull, Needham, North Attleboro and Peabody had specific sinking funds. Marblehead had provided for one in its vote. Of the remaining towns, all seem to provide for regular retirement of indebtedness by the payment of installments assessed in the tax budget.

None of the plants operated during 1894 can by any twist of figures be made to show as financial successes. Three of the plants, Danvers, Needham and Wellesley, furnished no commercial lighting. The Commissioners in their findings of the year made some statements worth quoting.

Cambridge Decision, p. 23, Report Jan. 1, 1895.—"When an investigation of a company's affairs has shown that quite a large amount of stock has been issued to its stockholders without being paid for in cash, it has seemed to be just that in such a case the dividend rate should be lowered. If the conservative policy of putting earnings into plant, without an increase of the capital stock, had been adopted, the Company would have had to-day a *real surplus*, which would have been at once a strength to it and a benefit to its consumers. The community gains by such a course, in a constantly lowering scale of prices, and the stockholders should, under the circumstances, expect a substantial return from their investment. Accumulated earnings should not themselves earn large dividends, but they may justly be used to maintain a liberal return upon the original capital, and at the same time to give the public the benefit of lowering prices. The Cambridge Gas Company has pursued this policy and it is sustained against the petitioner."

Haverhill Decision p. 24, Report Jan. 1, 1895.—"The consumer for the time being of any well managed quasi-public corporation gets advantages from the payments made to the Company by the consumers of the past. The consumers of the future should therefore be regarded by a board of control, and enough should be paid by the present consumers to provide for the natural growth of the community. Everything which the Company has taken in the past from its consumers, except the cost of manufacture, including regular dividends upon its capital, is to-day existent and used for the benefit of its customers."

This report is remarkable in that the Board granted the municipal plant of Wakefield the right to charge less than cost for its product. In other words, here is a case in which the entire community voluntarily taxed themselves for the benefit of a favored few consumers. This town did not have a sinking fund, but was required to retire its indebtedness by a tax levy.

The Report for 1904.—At the close of 1904, four municipalities supply both gas and electricity, a gain over 1894 of two plants. Seventeen municipalities supply electric current only, a gain over 1894 of nine plants. During 1904 two municipalities took legal action upon municipal ownership, Merrimac voting yes and West Springfield no. The following is a list of municipal plants:

TABLE I.

	Population.	Year began.	
1 Belmont	3,900	1898	Electric dis. plant.
2 Braintree	5,900	1892	
3 Chicopee	19,100	1896	
4 Concord	5,600	1900	
5 Danvers	8,500	1889	
6 Hingham	5,000	1893	Electric dis. plant.
7 Holyoke	45,700	1902	Gas and electric.
8 Hudson	5,400	1897	
9 Hull	1,700	1894	
10 Ipswich	4,600	1903	
11 Mansfield	4,000	1904	
12 Marblehead	7,500	1895	
13 Middleborough	6,800	1893	Gas and electric.
14 Miller's Falls	1,200	1904	
15 North Attleboro	7,200	1894	
16 Peabody	11,500	1892	
17 Reading	4,900	1895	
18 Taunton	31,000	1897	
19 Wakefield	9,300	1894	Gas and electric.
20 Wellesley	5,000	1892	Electric dis. plant.
21 Westfield	12,300	1899	Gas and electric.

As there were 10 plants at close of year 1894, the above shows an increase of 11 plants, including the three cities of Chicopee, Holyoke and Westfield. Needham has been dropped from the list by the Board.

Of those voting yes in the year 1894, Arlington and Medford do not appear on the 1904 report. Arlington reversed its vote in 1895 and Medford in 1897. The plants at Holyoke, Hudson and Taunton were taken by decree of the courts after protracted litigation.

A condensed table of operation is here submitted. This needs no explanation.

TABLE II.

21 Companies. Electric.	Year ending June 30, 1903.	1904.
Income from sales	$191,046.68	$236,841.54
Expenses	283,063.51	321,896.70
Loss in operating account	$92,016.83	$85,055.16
Add interest	$52,162 52	$61,725.99
Depreciation	66,219.34	85,851.27
Item losses	549.76	463.32
Leaving, as cost of town lights	$210,948.45	$233,095.74
Less gains on jobbing, etc	1,744.58	676.05
Net cost town lights	$209,203.87	$232,419.69
4 Companies. Gas.		
Income from sales	147,177.16	201,326.34
Expenses	100,895 28	134,161.01
Profit	$46,281.88	$67,165.33
Deduct interest	14,347.96	21,225.21
Depreciation	21,179.47	31,943.69
Item losses	151.10	635.52
	$35,678.53	$53,804.42
Less gains jobbing	84.25	60.73
	$35,594.28	$53,743.69
Gross profit	46,281 88	67,165.33
Net profit	$10,687.60	$13,421.64

We here append a comparative condensed balance sheet covering the two years, 1903 and 1904.

TABLE III.

Assets.	Year ending June 30, 1903.	1904.
Electric plant	$1,379,454.09	$1,562,414.15
" materials	45,176.98	52,132.30
Gas plant	764,003.97	751,468.93
" materials	18,660.34	27,940.61
Cash and town treasury	319,168.04	301,864.63
Due for electricity	33,652.82	43,668.64
Due for gas	18,611.41	19,056.33
Sundry accounts due	8,372.88	9,764.09
Sinking funds	110,013.27	128,931.39
Deficit	195,823.97	291,252.77
	$2,892,437.77	$3,188,493.84
Liabilities.	1903.	1904.
Appropriations for construction	325,646.00	381,899.04
" extraordinary repairs	5,720.10	5,720.10
" bond payments	137,900.00	182,100.00
" note "	87,780.00	116,875.00
" sinking funds	90,384.33	108,084.36
Overdrafts	57,182.43	104,977.06
Bonds outstanding	1,834,500.00	1,922,000.00
Notes payable	191,422.00	228,389.41
Unpaid bills	62,702.85	42,407.91

TABLE III.—*Continued.*

Liabilities.	Year ending June 30, 1903.	1904.
Deposits	$1,699.69	$1,943.00
Interest	11,983.00	13,705.62
Sundry accounts	885,517.37	80,392.37
	$2,892,437.77	$3,188,493.84

From this balance sheet we observe that the deficit in the whole operation increased $95,928.80, a tidy little sum for 21 plants to lose in one year.

We have strictly used the Commission's figures, because they use the same method of computation that is used for the private companies' accounts.

We give on page 136 abridged Table IV., showing the candle power of the electric street lights and the annual cost of each kind to its municipality. The following is the verbatim statement of the Commissioners:

"This table is compiled to indicate, as nearly as may be from the data available, the cost per lamp per year of the street electric lights in the several municipalities, as determined by the items shown and upon the average daily number of lights used during the year as given in the preceding table. The net loss in operating is the difference between the operating expenses and the income from commercial lighting. Interest is computed upon the total investment at the beginning of the year, at the rate paid upon the bonds or notes, and depreciation at the statutory rate of 5 per cent. upon the cost of the plant, as shown by the books at the beginning of the year.

"Whenever the lights are of different kinds or candle powers, the total cost obtained in the manner indicated is apportioned to each kind according to the amount of energy theoretically necessary under average conditions to maintain the lights at the standard candle power.

"The table is devised upon the theory that for all its expenditure the municipality received only its street lighting and the income from its commercial business, and that the cost of the former to the city or town is the difference between such income and the entire cost of carrying on the business.

"Obviously, this cost is affected by the profit or loss on the commercial lighting. The value of the interior lighting supply to municipal buildings is either included as a part of the commercial income, or is allowed in the computations at a fair amount, as determined by the respective managers."

It is evident upon inspection that there is a very wide difference between the costs as found by the Commissioners even in lights of same nominal candle power. A large part of this difference is to be found in the columns of the table showing the average number of hours run per day and the average number of days per month.

Holyoke, the largest town, has the best service, the correct number of average days and the largest number of average hours per day. The product of these numbers $10.8 \times 30.5 = 329.4$.[1] This number has in Table V. been considered as the numerator of a fraction whose denominator is the product of the numbers in the time columns of the Commissioner's Table.

The operating cost per lamp per year in the Commissioner's report have been multiplied by the value of this obtained fraction. To this value have been added the figures for interest, depreciation and other cost items given on page 87 of the report. From this result has been subtracted the figures given on same page for public building lighting.

The results in Table V. show a true relative cost and represent strictly the costs to the municipalities if all ran the same number of hours and days. This is the only way to compare the relative costs.

TABTE V.

1,200-C.P. Denominator.	Time Factor.	Cost on Holyoke Time.	Increase on Reported Figures, Per cent.	Number of Lights.
Belmont 147.28	2.23	$111.29	13.4	
Braintree 206.46	1.59			
Chicopee 265.50	1.24			
Danvers 145.20	2.27	115.40	74.0	124
Hingham 127.40	2.58			
Holyoke 329.40	1.00	97.15		332 water power.
Numerator.				
Hudson 151.20	2.17			
Mansfield 323.30	1.01			
Middleborough 136.29	2.41			
Peabody 283.65	1.16			
Reading 127.40	2.59	69.10	29.5	138
Taunton 244.85	1.34	145.82	9.5	247
Wakefield 135.00	2.44	154.48	85.4	145

1 For the leap year = 366 days × 10.8 = 3,953 hours.

TABLE IV.—*Cost of Street Lighting.*

	Hrs. per Night.	Days in Month.	Incandescents. 16 C. P.	25 C. P.	32 C. P.	60 C. P.	Arcs. 1,000 C. P.	1,200 C. P.	1,500 C. P.	1,600 C. H.	2,000 C. P
Belmont	5.6	26.3	....	....	$20.59	$38.70	....	$76 44	....	...	....
Braintree	7.4	27.9	....	$15.94	....	....	....	74.60	...	....	....
Chicopee	9.0	29.5	....	....	....	....	....	98.12	....	....	....
Concord	8.4	28.2	....	9.67	....	....	$41.74	....	....	....	....
Danvers	6.0	24.2	....	....	....	....	....	67.46	....	....	....
Hingham	5.2	24.5	....	....	14.81	....	....	56.61	....	....	....
Holyoke	10.8	30.5	$13.16	....	....	....	....	97.15	....	....	....
Hudson	5.6	27.0	....	....	22.32	....	....	106.03	....	....	....
Hull	5,1	23.9	....	37.65	....	....	....	....	....	....	....
Ipswich	9.9	25.4	....	8.59	...	....	....	....	....	....	....
Mansfield	10 6	30.5	....	....	14.48	....	....	53.39	....	....	....
Marblehead	8.8	28.1	....	....	14.03	....	....	....	....	$50.38	....
Middleborough	4.7	21.6	....	....	....	....	....	....	....	....	....
	4.7	21.6	....	....	....	....	....	....	....	....	....
½x½	7.1	24.7	....	24.96	....	....	....	99.41	....	....	....
Millers Falls	5 3	21.8	....	20.90	....	....	....	....	$90.30	....	....
No. Attleboro	5.2	24.2	....	....	11.91	....	....	....	....	....	....
Peabody	10.3	23.5	....	....	....	....	....	....	....	....	....
	9.3	30.5	....	....	....	....	....	....	....	....	....
	9 3	30.5	11.18	....	22.04	....	....	81.73	....	....	....
Reading	5.2	24.5	....	....	....	....	....	53.34	....	....	....
Taunton	8.3	29 5	....	9.22	....	....	....	133.07	....	....	...
Wakefield	5.4	25.0	....	....	....	....	....	83.31	....	....	....
Wellesley	4.8	21.7	....	19.72	....	....	....	....	....	....	....
Westfield	10.6	30.5	....	20.37	....	....	....	....	....	....	$109.62
Average	7.4	26.0	....	....	....	....	....	....	....	....	....

Only the cities reporting 1,200-candle power lamps are considereed in Table IV. We at once see from the column "Time Factor" how the lighting hours compare with Holyoke taken as unity. We have only computed the cost column for five companies to compare with Holyoke on account of the other cities having so many different kinds of lights, but we see at once that all of these five cities are greatly in excess of Holyoke, and also of the well known averages of private companies throughout the country for 1,200-candle power arcs, except the single town of Reading. I have been unable to account for the low cost in Reading except from a very small capital account.

TABLE VI.

Incandescents.	Denominator.	Time Factor.	Cost on Holyoke Time.	Increase over Reported Figures. Per Cent.	Number of Lights.
Hull	121.89	2.72	39.90	6.0	321-25
Ipswich	251.46	1.31	11.67	36.3	634-16 7.5mo. op.
North Attleboro	125.84	2.61	15.72	32.0	613-32
Wellesley	104.16	3.16	57.22	190.0	615-25

Table VI. shows same computations for incandescents in 4 towns. The cost of these lights compared with regular prices quoted everywhere by private companies is to be noted.

Table VII. is designed to exhibit some 18 towns of different sizes having 1,200-candle power arcs. It shows the average number of 1,200-candle power public lamps in use, the number of hours per day and days per month. The product of hours by days per month or lighting hours and the annual price charged.

TABLE VII.

Town.	Average No. Lamps.	Number Hours.	Number Days.	Product.	Price.
Abingdon	48	5.1	26.0	132.60	$70.00
*Adams	69	10.9	30.5	332.45	85.78
Amesbury	41	5.9	24.4	143.96	75.00
Athol	60	4.8	25.1	120.48	75.00
Attleborough	90	5.3	25.1	133.03	75.00
*Beverly	226	10.5	30.5	320.25	100.00
Easthampton	50	4.3	20.6	88.98	67.50
*Brockton	273	10.8	30.5	329.40	87.00
Gloucester	66	8 6	28.7	246.82	82.00
*Lawrence	183	10.9	30.5	332.45	80.00
Leominster	80	6.3	27 0	170.10	72.00
*New Bedford	219	10.5	30.5	320.25	98.55
Newburyport	159	5.9	24.3	143.37	73.50
*Newton	232	10.9	30.5	332.45	100.00
*North Adams	176	10.9	50.5	332 45	86.00
Northampton	118	5.3	30.0	162.00	74.00
*Springfield	910	10.7	30.5	326.35	73.00
Waltham	159	6.7	30.5	204.35	84.00

* It will be seen from Table VII. that 8 companies have almost identically the same number of lighting hours as Holyoke, viz.: Adams, Beverly, Brockton, Lawrence, New Bedford, Newton, North Adams and Springfield. Every one of these private companies charge less than Holyoke, except Newton and Beverly $2.85 more each, and New Bedford $1.40 more. Holyoke runs with water power, and so does Springfield and Lawrence. Springfield's cost is $17.15 less, Lawrence's cost is $24.15 less.

It will be remembered that all of the municipal companies tabulated pay 4 per cent. on the average for their bonds and notes. The Springfield company pays an average of over 5 per cent. on its debt, 8 per cent. on its stock, sets aside $50,000 for depreciation fund, which is 6¼ per cent. upon its stock, and other items are also provided for, and yet can undersell Holyoke, only a dozen miles away on the same railroad, $17.15 per public lamp; and let it be remembered Springfield pays annually in public taxes $16.37 per lamp. If this sum were deducted from the price charged, we have the astonishing sum of $56.63 per annum for 1,200-candle power arcs during 10.8 hours per day every day, or $\frac{1}{10}$ of an hour more than Holyoke. Now these towns are strictly comparable in everything. Let us note how these 8 companies conducted their depreciation funds.

TABLE VIII.

Adams charged off $2,104.29 more than entire capital stock.
Beverly " " 8.4 per cent. on entire capital.
Brockton only paid 5 per cent. dividend, putting balance in reserve.
Lawrence put $25,000 into reserve.
New Bedford charged off 8.2 per cent. to depreciation and $22,520.38 to reserve.
Newton carried $34,000 to reserve.
North Adams charged off 22.6 per cent. to depreciation.
Springfield " " 6¼ " " " " and $13,776.94 to reserve.

This is most remarkable! It shows plainly that the legal 5 per cent. off for depreciation of municipal plants is not enough.

Table IX. shows taxes paid per 1,200-candle power arc, the prices per annum less the tax, for the eight companies having lighting hours like Holyoke.

TABLE IX.

	Taxes Paid.	Number 1,200 C. P.	Amount Tax per Arc.	Price. 1 Yr. Tax.	Price.
Abingdon	$1,678.29	48	$34.97		
Adams	190.71	69	2.76	$83.02	$85.78
Amesbury	538.31	41	13.13		
Athol	790.18	60	13.17		
Attleboro	1,655.26	90	18.39w		
Beverly	2,051.69	226	7.51	92.49	100.00
Easthampton	183.53	50	36.61		
Brockton	5,504.38	273	20.16	66.84	87.00
Gloucester	1,698.42	66	25.73		
Lawrence	4,178.31	183	22.83w	57.17	80.00
Leominster	1,276.39	80	25.73		
New Bedford	8,532.41	219	38 91	59.64	98.55
Newburyport	1,195.45	159	7.51		
Newton	4,013 62	232	17.30	82.70	100.00
North Adams	1,746.06	176	9.92	86 08	86.00
Northampton	1,908.52	118	16.17		
Springfield	14,902.31	910	16.37w	56.63	73.00
Waltham	2,587.80	159	16.27		

Note.—w = Water Power Companies.

Table X. shows municipal plants, their investment, tax rate, assessment and lost tax, number of arcs or incandescent lights, and tax per light, which tax should be added to the annual cost per Table IV. and Table V.

TABLE X.

Town.	Investment.	Tax Rate.	Assessment.	Taxes.	Number Arcs.	Tax per Arc.
Belmont	$32,948	$17.00	$20,000	$340.00		
Braintree	122,393	20.50	80,000	1,640.00		
Chicopee	167,542	18.60	112,000	2,083.20	181	11.58
Concord	101,382	13.90	75,000	1,042.50		

TABLE X.—*Continued.*

Town.	Investment.	Tax Rate.	Assessment.	Taxes.	Number Arcs.	Tax per Arc.
Danvers	$56,537	$16 40	$36,000	$590.40	124	$4.76
Hingham	33,379	16.80	22,000	369.60		
Holyoke	912,862	16.40	608,000	9,971.20	332	30.00
Hudson	74,157	21.20	50,000	1,060.00		
Hull	156,206	18.50	102 000	1,887.00	321-255	5.88
Ipswich	32,045	11.00	20,000	220.00	634-165	.34
Mansfield	45,537	22.00	30,000	660.00		
Marblehead	119,718	19.00	80,000	1,520.00		
Middleborough	120,084	22.25	80,000	1,780.00		
Millers Falls	15,295	20.70	10,000	207.00		
North Attleboro	85,384	24.00	56,000	1,344.00	613-325	2.19
Peabody	110,719	19.00	73,000	1,387.00		
Reading	85,299	20.00	56,000	1,120.00	138	8.11
Taunton	341,225	20.40	226,000	4,610.40	247	18.66
Wakefield	219,065	19 40	146,000	2,832.40	145	19.53
Wellesley	20,233	12.00	12,000	144.00	615-255	.23
Westfield	161,000	16.40	106,000	1,738.40		

This table is computed on the assumption that if the municipal plant were privately owned at the cost invested and assessed at two thirds valuation at the given town rate, the tax lost is a proper charge against the cost of municipal lighting, *because all public building lighting has already been allowed for in computing the cost of public lighting by the Commissioners.* From this we see that Holyoke must add $30 to her reputed cost of $97.15, making $127.15 as *the real cost* of her arcs less the *pro rata* for 21 small incandescents.

We submit here Table XI., showing the gas sales of the 4 municipal companies.

TABLE XI.

	1904 per 1,000			
	Cost.	Selling.	Profit.	Loss.
Holyoke	$1.18	$1.32	$9.14	....
Middleborough	4.18	2.10	....	$2.08
Wakefield	1.79	1.69	....	.10
Westfield	1.30	1.47	.17	....

Report, page 89.

It is very clear that in allowing communities to sell at cost or below, with 5 per cent. depreciation, the Gas Commissioners are not following the dictum in the Haverhill decision, quoted above and again quoted here: "The consumers of the future should, therefore, be regarded by a board of control, and enough should be paid by the present consumers to provide for the natural growth of the community."

It is evident that the Commissioners say to themselves: "If the public want to run themselves into debt and conduct business at a loss, let them do so, because they pay the bill."

Thus far we have said nothing about sinking funds and the amount per lamp from these funds per annum, but the reports are in such form it is impossible to analyze them for this purpose.

We note that Belmont, Hudson, Ipswich, Marblehead, Middleborough and Peabody neglected to make their annual returns in the time required by law, showing as great a neglect in this case as the private companies.

The writer has been unable to devote the necessary time to analyzing the "energy outputs" of the different companies and the individual balance sheets.

A clipping bureau should be established for clippings referring to municipal ownership. It will be found to prove of surprising bulk as well as of great value. I reproduce here two clippings from papers since beginning this article a week ago.

Clipping No. 1.—Aug. 31, 1905—Binghamton Press, N. Y.—Waverly's Decision.—"Waverly yesterday decided the question of municipal ownership in the right manner. The majority was comparatively small, but it was really large, when all the factors that figured in the election are considered. The proposition to buy the Company's plant at the price named obligated the village for a large sum. The courage and sagacity of Waverly's taxpayers were equal to the occasion, however, and they spoke for progress and home rule. Waverly will pay $125,000 for the property, franchises and goodwill of the Waverly Water Company. *A large share of this money will go to pay for something which the village once gave away for nothing—the franchise.* Without the franchise the rest of the property would not be worth a cent. The lesson should be plain for all cities and villages. Franchises are worth money. Do not give them away in perpetuity. Always exact a money return or rental for them when granted for a term of years. Best of all, have enough civic pride to empower your city or village to operate its own public utilities."

Clipping No. 2.—New York, Sept. 14.—"Municipal ownership has scored a signal victory in the election of Everett Colby to the leadership of Essex county, N. J. On a platform which contained that principle as its cardinal issue, Mr. Colby is now reaching out for the State Senate, where he will continue his fight for the government control and operation of public utilities. This will be the first time in the history of the State that an advocate of that principle has ever entered the Senate. The delegates elected at the primaries on Tuesday night met in convention last night and named Colby as the Republican candidate for Senator from that district. He is confident that he will be elected by as sweeping a majority as that which marked his defeat of "Boss" Carl Lentz and his Republican machine. Mr. Colby and his followers say the defeat of Lentz and his powerful ring means: A crushing blow to the Public Service Corporation, which controls all the trolley, gas and electric lighting franchises of northern New Jersey; an end to the combination between that corporation and the machine legislators who have been constantly voting it valuable franchises for practically nothing; the granting hereafter of only limited franchises; municipal ownership of public utilities wherever possible; equal taxation, the corporations paying the same rate as the individuals; a strong effort to force the adoption of the principle of the election of United States Senators by the people."

The municipal engineering journals, of which there are several, will be found to contain large quantities of matter on this subject. The reports of towns having municipal ownership should be gathered and analyzed, such as Detroit and Holyoke, for instance.

The writer has prepared this report on municipal ownership to assist, if possible, the Committee of the Western Gas Association in its labors.

(Signed) FRED. B. WHEELER.

The President—You have heard the reading of the report, gentlemen. What is your pleasure? The recommendation is that it be referred to the Board of Directors. If there is no objection the report will be so referred. The Secretary will read the

REPORT OF THE COMMITTEE ON PUBLISHING PROCEEDINGS.

To the President and Members, Western Gas Association—The proceedings for the years 1903-04-05 have been published during the past years and distributed to members of the Association. It is the intention to publish the proceedings of the present year and distribute within three or four months.

O. O. THWING,
WILLIAM MCDONALD,
JAMES W. DUNBAR, } Committee.

Discussion.

The President—You have heard the reading of the report, gentlemen. What is your pleasure?

Mr. Egner—Mr. President, for the next publication, which will probably be the last, I suppose the committee will do as they please, but I should like to suggest that they would put in among those pictures that they usually have of past Presidents our Secretary, Mr. Dunbar. I think it would be a deserved compliment. If it could meet with a second, I would like to make a motion that the Committee on Publication be asked to do that. (Seconded.)

The President—It is regularly moved and seconded that the Committee on Publication, in publishing the proceedings, add to the collection of portraits that of the Secretary, Mr. Dunbar.

Mr. Egner—Mr. President, of course they put the President in also.

The President—Hearing no objection, I will order the committee to do it.

Mr. Mitchell—Mr. President, I would like to know about what are the chances for getting the back volumes of the proceedings of the Western Gas Association. They are not published yet. What is the possibility of our getting those back volumes?

The President—Will you answer that, Mr. Dunbar?

The Secretary—The principal objection is that we have no funds available. The Western Gas Association did not publish its proceedings and did not commence work on this line until about 6 years ago, when it was determined that we publish the proceedings from the commencement of the Association. The committee went back some 10 or 12 years, thinking that the proceedings of the more recent years would be the most interesting, and they determined that after the proceedings were published up to date they would then take the earlier years of the Association. But as the Association has terminated its existence, and as funds are not available, this cannot be done without special arrangement.

The President—You might suggest, Mr. Mitchell, that consideration of the publication of the proceedings of the earlier years shall be given by the Committee on Publishing Proceedings.

Mr. Mitchell—Yes, I will make that request, that consideration be given by the committee to the publication of the preceding volumes. Many of our members would like to have these volumes, and they would be willing, I think, to buy them.

The Secretary—We will see what we can do.

The President—The matter has been referred to the Committee on Publishing Proceedings. Report of Committee on Next Place of Meeting, Mr. Shelton, Chairman.

The Secretary—No report.

The President—Mr. Warmington is not present. In the absence of

the report of the Committee on Next Place of Meeting, for the purpose of record I will say that there will be no report from the committee at this time. The matter of the next place of meeting will probably be taken under advisement by the committee on organization of each of the Associations about to be merged. I believe that was the practice in the American Gas Light Association, Mr. Forstall, was it not?

Mr. A. E. Forstall—There has been no report from that committee. It was appointed, but it was decided that it should not report until the situation had developed. I presume there will not be any report from the committee now.

The President—Yes; and I believe the same thing obtained in the Ohio Gas Light Association. We have a few more regrets which I will ask the Secretary to read.

Letters of Regret.

The Secretary—I have a letter from Mr. James Ferrier, wishing us a successful meeting and regretting his inability to be present. I have a letter from Mr. Wm. McGregor, the Secretary and Superintendent of the Pawtucket Gas Company; also a letter from Mr. Thwing, who very greatly regrets his inability to be present. Mr. McGregor's letter is as follows:

PAWTUCKET, R. I., May 12, 1906.

JAMES W. DUNBAR, Secretary, Western Gas Association, New Albany, Ind. Dear Mr. Secretary: I have the honor to acknowledge the receipt of your very courteous and much appreciated invitation to be present as your guest at the 29th annual meeting of your Association. Very much to my regret and to my infinite disappointment I find at this late hour I am compelled by business pressure to give up my cherished plan of being present and enjoying all the wealth of good things that you have made arrangements for, as the programme eloquently testifies. On behalf of the New England Association, permit me to extend the right hand of fellowship; may your meeting be a grand one—illuminating, inspiring and encouraging—and may renewed strength and convictions come to the individual member through the coming together of the Association, Antaeus-like, getting power by contact. My best thanks, my best wishes, are due you. Most cordially yours,

WM. MCGREGOR, President N. E. A. G. E.

Table No. I.

4'0" Machine

Name of Company	Number	Average Daily Make	Kind of Fuel	Average Depth of Fuel Bed	Pounds Fuel per M.	Kind of Oil from	Gravity in Degrees Baumé	Kind of Spray	Gallons of Tar per 100 Gal. of Oil	Temp. of Gas at Inlet to Purifiers in Summer	Temp. of Gas at Inlet to Purifiers in Winter	Gas Carries	Bayou increase Oil in Washer?
Aberdeen	2	50 000	Hard Coal	7'0"		Ohio	38					Well	No
Athol		20 000	Bit Coal	5'0"	75.0	Texas	28					Well & P Drop	Yes
Brookfield	1	25 000	Pitt Coal	5'6-6'0"	40.0	Kansas	32			60	45	Well	Yes
Consumers Gas Co	2	16 000	R H Coal	4'6 to 5'0"	65.0	Pennsylv.	22 & 24			70 @ 75	50 @ 55		
Mt Carmel	1	12 000	Hard Coal	5'0"	90.0	Pennsylv	35 & 40					Well	Yes
Oneonta	2	30 000	Hard Coal	5'0	75.0	Pennsylv				80	80	Well	Yes
Sag. Harbor	1	32 000	Hard Coal	4'6"	50.0	Texas	35					Well	Yes
Wallingford	1	40 000	Hard Coal	5'0"	60.0	Texas			5			Well	Yes
N	2	35 000	Oven Coke	5'6"	54 3	W Virginia			2.5	88	60	Well	Yes
O	1	15 000	Hard Coal	6'0	60.0	Pennsylv						Well	Yes
P	1	30 000	Hard Coal	4'0"	45.0	Indiana	38 @ 40		8	70 @ 75	65 @ 70		Yes

Name of Company	Nature Power for Producing Blast	Nr Cleanings in 24 Hours	Is Economizer Doubtful	Pull all Fire from Generator every	Inches Blast Measured on Generator	Size of Blast Opening in Generator	Inches Blast Measured on Carburetter	Size of Blast Opening in Carburetter	Inches Blast Measured on Superheater	Size of Blast Opening in Superheater	Average Length of Blow	Boiler Steam Pressure	Average Length Run	Seconds Purging Allowed	Chq. Brick Spacing Carburetter	Chq. Brick Spacing Superheater
						Inches Dia		Inches Dia		Inches Dia						
Aberdeen	Steam	1	Yes	Only for Reburns	14"	6"					6	110	5	None	2½	2½
Athol	Electricity	3	No	4 Months		6"		3"		4"	12	115	8	3 @ 5	2½ x 4	2½ x 4
Brookfield	Steam	1	No	Only for Reburns	9"		5"	6" 3 open	3"	6" 3 open	6	80	7			
Consumers Gas Co	Steam	1	No	Only for Reburns	6 & 8"	6"	4 & 6"	6"	4 & 8"	Water Gas 6" Main	8	90,100	10		2½ – 2¾	2½ – 2¾
Mt Carmel	Steam	1	Yes	2 Months		3"		3"		3"	10	90-100	6		2	2
Oneonta	Steam	3	Slightly	2 weeks	15"		15"		15"		5	85	5			
Sag. Harbor	Steam	1	Yes	2 weeks	4"	6"	4"	4"	4"	4"	9	80	9		1¾	1¾
Wallingford	Steam	2	No	30 Days	12"						7	80	5	30	2½	2½
N	Steam	6	No		16"	6"	14"	3½"	14"	3½"	30	80	6		2	2
O	2 engs Nat Gas	2	No		13"	3"					7	90	7		2½	2½
P	Electricity	2	Slightly	Only for Reburns	14"		11"	4"	11"	4"	6	85	8	30;60	2	2

Table No 1

Table No. II.

5'0" Machine

Name of Company	Number	Average Daily Make	Kind of Fuel	Average Depth of Fuel Bed	Pounds Fuel per M.	Kind of Oil from	Gravity in Degrees Baumé	Kind of Spray	Gallons of Tar per 100 Gal. of Oil	Temp. of Gas at Inlet to Purifiers in Summer	Temp. of Gas at Inlet to Purifiers in Winter	Gas Carries	Bayou increase Oil in Washer?
Auston	2	85000	Oven Coke	10' 0"	50	Texas	22	Whirling Center			60		
Burlington	2	140 000	Hard Coal	5' 0"	45–50		38–40	Center				Well	No
Northern Westchester	1	30000	Hard Coal	4' 0"	45	Pennsylvania	25	Center	25	90	75	Well	Yes
Npack	1	35000	Hard Coal	5' 0"	40	Pennsylv.		Center					Yes
Oklahoma	1	50000	R.H. Coke	6' 0"	45	Texas		Center		60	60		Yes
Ostwosa	1	35000	R.H. Coke	4'6"	44		38–42		5	75	60	Well	Yes
Pittsfield	1	70000	R.H. Coke	6'6"	38	Pennsylv	38	Center	2	Temp. Attends	70	Slight Odor in C.H.P.	Yes
I	2	150000	R.H. Coke	5'6"	34	Ohio	37					Well	Yes
M	1	100000	Hard Coal	7'0"	41–43	Texas	37–42	Center		90	70–80	Well	Yes

Name of Company	Nature Power for Producing Blast	Nr Cleanings in 24 Hours	Is Economizer Doubtful	Pull all Fire from Generator every	Inches Blast Measured on Generator	Size of Blast Opening in Generator	Inches Blast Measured on Carburetter	Size of Blast Opening in Carburetter	Inches Blast Measured on Superheater	Size of Blast Opening in Superheater	Average Length of Blow	Boiler Steam Pressure	Average Length Run	Seconds Purging Allowed	Chq. Brick Spacing Carburetter	Chq. Brick Spacing Superheater
						Inches Dia		Inches Dia		Inches Dia						
Auston	Steam	3	Yes	15 Days	13"	8"	13"	6"	6"	6"	6	100	15			
Burlington	Hydraulic Steam	4 to 6	No	Only for Reburns	15"	6"	12"	4" 2 open	12"	9" 3 open	6-10	100	6-10	4 to 5	2	2
Northern Westchester	Steam	Hydraulic Steam	Slightly	Only for Reburns	13"		Very Little		None		5	100-110	6	None	2½	2½
Npack	Steam	4	No	3 Months	13"		13"		13"		7	95	7		2½	2½
Oklahoma	Electricity	4 to 6	No	7 Days	15"	6"	7"	6"	4"	6"	3	100	6		2½	2½
Ostwosa	Steam	1	No	30 Days	7"	6"	7"	4"			9	100	8		3	3
Pittsfield	Steam	3	No	90 Days	15"	8"	6"	6	5" over 3" on Main	6"	3	100	6	60	3	2½
I	Steam	4	Slightly	4 Months	8"	6"	Very little		Very little		7	110	7		2	2
M	Steam	2	No	Only for Reburns	14"		8"		None		6½	125	7		2	2

Table No 2

The President—The next order of business is the presentation of a paper by Mr. D. G. Fisher, on

WATER GAS PRACTICE.

Mr. Fisher—Mr. President and Gentlemen, I would like to take this opportunity of thanking all those who so kindly contributed data to the paper, and to apologize for a few omissions occasioned by the late arrival of the information.

On being assigned the above subject, the writer decided to collect as much data as possible on methods in vogue and results obtained, believing that a compilation and summary of such information would be of interest to everyone connected with the manufacture of water gas, and of value to those who may not be familiar with the practice of other plants.

With this end in mind, a blank form of questions pertaining to the operation of water gas machines was gotten out and mailed to every company in the United States engaged in its manufacture. The replies as tabulated below are somewhat disappointing, both as to number received and data furnished, though enough material has been gathered to show average practice. Lines designated by letters of the alphabet refer to plants that did not care to be quoted by name.

The material gathered has been classified in Tables I. to VII., inclusive, according to the sizes of machines installed. Table No. VIII. gives general chemical data. The average daily make, as shown, is the total average daily output of the water gas plant quoted, and not the capacity of the particular machine with which it is tabulated. This has been included that the reader may be able to take into consideration the output of the plant in question before drawing any conclusions. We all know the best results are obtained when the requirements of the station are about equal to the capacities of the units operated, and that too much weight should not be given results from plants that operate intermittently or far below their capacity. I had hoped to draw certain definite conclusions from the tabulated reports, but owing to the comparitively small number received and the late date at which the bulk

TABLE NO. III.

6:0" Machine

Name of Company	Number	Average Daily Make	Kind of Fuel	Average Depth of Fuel Bed	Pounds Fuel per M	Kind of Oil from	Gravity at Degrees Baumé	Kind of Spray	Gallons of Tar per 100 Gal. of Oil	Temp. of Gas at Inlet to Purifiers Summer	Temp. of Gas at Inlet to Purifiers Winter	Gas Carries	Do you increase Oil in Winter?
Clinton	2	38000	R.H Coke	5'6"	36	Indiana		Center		60	60	Well	No
Easton	2	240000	Hard Coal	6:0"	36	Texas		Center		90-100	80	Well	Yes
Elizabethtown	3	500000	½ Hard Coal ½ Coke	6:0"	36	Texas	28	Center		70	50	Well	No
Grand Rapids	1	180000	R.H Coke	7'0"-6'0"	35	Indiana	36-38	Center				Water Gas	No
L.H & P. Co	1	75000	48 Hours Green Coke		43	Mixed Oils				90	90		No
N.Y. & Richmond	1	500000	Hard Coal	6'0"	38.8	Texas	27	Center					Yes
Shreveport	1	100000	R.H Coke	4'0"	40	Crude		Side	5			Well	No
Suburban of Phila	1	850000	Hard Coal	5'0"		Texas	28.5	Center		90	60		Yes
Wilkes Barre	2	415000	Hard Coal	6'0"	40	Crude Texas	32					Well	Yes
E	1	135000	R.H Coke	7:0"	37-45	Crude Indiana		Center		84	66		No
G	1	275000	Hard Coal		40	Mixed Pennsylv	34	Center	.4--.5				
H	1	140000	Hard Coal	7:0"	45	Crude Texas				86	60	Well	Yes
S	1	125000	R.H Coke	9'0"									Yes

Name of Company	Water Power for Producing Blast	No Cities or gas each 24 Hours	To Edging in Generator or Doubleasers	Pull all Fire from Generator every	Inches Blast Maintained in Generator	Size of Blast Opening in Generator	Inches Blast Maintained in Carburetter	Size of Blast Opening in Carburetter	Inches Blast Maintained in Superheater	Size of Blast Opening in Superheater	Average Length of Blow	Boiler Steam Pressure	Average Length Run	Seconds Purging Allowed	Chq. Brick Spacing Carburetter	Chq. Brick Spacing Superheater
						Inches Dia		Inches Dia		Inches Dia						
Clinton	Steam	12	Slightly	Only for Repairs	16"	12"			16"	12"	6	90	6	10	4 x 6	4 x 6
Easton	Steam	1	No	Only for Repairs	15"	8"	2"	6"	1"	6"	5	95	7		2½	2
Elizabethtown		3	No	Daily	11"	8"	7"	6"	None		6	100	6	None	2	1½
Grand Rapids	Steam	3	Slightly	Rarely	15"	8"	8"	6"	8"	6"	5	100	6	None	2	2
L.H&P. Co	Steam		No	7 Days	17"		15"		15"		12	95	8		2½	2½
N.Y.&Richmond	Steam	3	No	3 Months	11"	8"	6"	8"	None		6	120	8	None	2½	2½
Shreveport	Electricity	1	No	24 Hours	6"		4½"		3"		5	30	6		2½	2½
Suburban of Phila	Steam Turbine	2	No	Only for Repairs	14"	8"	6"		6"		5	125	5	None	2	2
Wilkes Barre	Steam	3	Yes	6 Months	14"		14"				10	100	9			
E	Steam Electricity	2	Yes	4 Days	10"	10"	1"	6"	¼"	6"	4½	125	6	30-40	2½	2
G	Steam	2	Yes	12 Hours	14"	8"					8	100	8	60	2	2-2½
H	Steam	6	Yes	4 Months	12"						6-7	100	6	10	2	2
S	Steam	1	No	Only for Repairs	10"						7		7			
																Table No 3

TABLE NO IV

7:6" Machine

Name of Company	Number	Average Daily Make	Kind of Fuel	Average Depth of Fuel Bed	Pounds Fuel per M	Kind of Oil from	Gravity at Degrees Baumé	Kind of Spray	Gallons of Tar per 100 Gal. of Oil	Temp. of Gas at Inlet to Purifiers Summer	Temp. of Gas at Inlet to Purifiers Winter	Gas Carries	Do you increase Oil in Winter?
Citizens Gas Co	-	100 000 & 00 000	Hard Coal	5:0"		Crude Texas		Whirling Center		110	75	Well	Yes
Holyoke	1	90 000	R. H. Coke	5:6"		Pennsylv. Fields	25-34	Center		80	70	Well	Yes
Indianapolis	2	1000 000	R H Coke	8:0"	33	Indiana	36	Center	3.00	75-80	65	Water Gas	Yes
Lynchburg	1		R H Coke	3:6"				Center		85	55		Yes
N.Y. & Richmond	1	500 000	Hard Coal	6:0"	38 80	Texas	27	Center					Yes
Suburban of Phila	1	850 000	Hard Coal	5:0		Texas	28.5	Center		90	60		Yes
A	2	3000000	48 Hours Generator Coke	8:6"	35.83	Indiana	37	Whirling Center	17.2	85	72	Water Gas	Yes
D		275 000	Brown Coal	6:0"	38	Pennsylv	34-37	Center	10.00	75	60	Well	Yes 10%
E	1	135000	R.H Coke	8:0"	37-45	Crude Indiana		Center		84	66		No
F	1	300000	Broken Coal		33		34		5.00	90	80	Slight Odor	Yes
H	1	200 000	R H Coke	8:0"	40	Mixed Oils Pennsylvania	35	Center			75	Slight Odor 2 miles	Yes
K	1	300000	Hard Coal & Coke	5:0"		Texas	26.5	Center				Water Gas in Winter	Yes
L	1	730000	Hard Coal	6:0"	28.5-31.0	Texas	29	Side		80	74	Well	Yes

Name of Company	Water Power for Producing Blast	No Cities or gas each 24 Hours	To Edging in Generator or Doubleasers	Pull all Fire from Generator every	Inches Blast Maintained in Generator	Size of Blast Opening in Generator	Inches Blast Maintained in Carburetter	Size of Blast Opening in Carburetter	Inches Blast Maintained in Superheater	Size of Blast Opening in Superheater	Average Length of Blow	Boiler Steam Pressure	Average Length Run	Seconds Purging Allowed	Chq. Brick Spacing Carburetter	Chq. Brick Spacing Superheater
						Inches Dia		Inches Dia		Inches Dia						
Citizens Gas Co	Steam	1	No	Only for Repairs	19"	10"	16"	8"	14"	6"	10	95	8		2	2
Holyoke	Steam	2	No	Only for Repairs	13"	6"	14"	14"	14"	1"	6	100	6½		2½	2½
Indianapolis	Steam, Electric & Steam Turbine	2	No	Only for Repairs	15"	10"	14"	8"	None	8"	6	125	6	5	2	2
Lynchburg	Water Power	1	Yes	7 Days	14"	10"	12"	8"	8"	6"	6	80	6	15 to 20	2	1½
N.Y. & Richmond	Steam	3	No	3 Months	11"	8"	6"	8"	None		6	120	8	None	2½	2½
Suburban of Phila	Steam, Turbine	2	No	Only for Repairs	14"	10"	8"		6"		5	125	5	None	2	2
A	Steam	1	Yes	Millhours	16"	10"	5"	25 square"	None		4	115	4	30	2 3	2½
B	Steam Turbine	1	Slightly	14 Days	16"	12"	18"	10"	6"	8"	6	125	7		2	2
E	Steam Electricity	2	Yes	4 Days	10"	15"	1"	8"	¾"	8"	4	125	6	30-40	2½	2
F	Electricity	2	No	Only for Repairs	14"	10"	8"	8"	None		5	110	6		2½	2½
N	Steam	1	No	60 Days	12"	10"	10"	5"-2 square	6"	5"-2 square	7	90	7	60	2	2
R	Steam	2	No	Only for Repairs	12"	10"					6	95	6		2½	2½-2
L	Steam Turbine	2 to 3	No	4 Months	17"	12"	8"	8"		8"	5	120	7	None	2	2
																Table No 4

TABLE NO. V.

8'6" Machine

Name of Company	Number	Average Daily Make	Kind of Fuel	Average Depth of Fuel Bed	Pounds Fuel per M	Kind of Oil from	Gravity in Degrees Baumé	Kind of Spray	Gallons of Tar per 100 Gal of Oil	Temp of Gas at Inlet to Pure Tyre in Summer	Temp of Gas at Inlet to Purifiers in Winter	Gas Carries	Do you increase Oil in Winter
Detroit	3	1800000	R.H Coke	8'0"	33.00	Indiana	35	Center	8.00	75-85	75-90	Well	Yes
Fall River	4	1100000	Hard Coal	7'0"	31.50	Texas	28	Center	25.00	80	80	Blower 1 1/2 lb	Yes
Grand Rapids	1	180000	R.H Coke	7'6"	35.00	Indiana	36-38	Center					No
Laclede	5	6180000	R.H Coke	8'6"	30-35	Kansas	32	Watering Center	12.4	80-100	70-90	Blower 1 1/2 lb	Yes
Lowell	3	800000	R.H Coke	6'0	34.00		29	Center	10.00	100	100	Blower 2 lb	Yes
Lynn	2	300000	R.H Coke		36.00		28	Center		90	96		
Milwaukee	2		R.H Coke	8'0"	3000-32.00	Pennsylvania	35-37	Watering Center	12.00	85	90	Well	No
New Haven	3	1500000	R.H Coke & Hard Coal		38.80	Texas Summer Pure Indiana Winter	26-34	Center	1400-1400	90-135	85-90		Yes
New Orleans	2	2200000	Oven Coke	6'0"	35	Crude Louisiana	35	Center	12.00	84	81	Well	Yes
Springfield	1	125000	R.H Coke	6'0"	39-40	Indiana		Center		195	90-100	Well	Yes
Suburban of Phila	1	850000	Hard Coal	5'0"		Texas	28.5	Center		90	60	Blower 1 1/2 lb	Yes
A	3	3000000	24 Hours Oven Coke	8'6"	33.85	Indiana	37	Watering Center	17.2	85	72	2 1/2 lb Blower	Yes
B	3		Hard Coal	4'0"	36.00	Pennsylvania	34	Center	6.95	80	60		Yes
C	2	1000000	Oven Coke	7'6"	35.00	Crude Texas	22-28	Center	11.00	70	60	Well	No

Name of Company	Water Power for Producing Blast	Nº Cha- rges made in 24 Hours	To Edging in Generator Possible max	Pull off Fire from Generator every	Inches Blast Maintained in Generator	Size of Blast Opening in Generator	Inches Blast Maintained in Carburetter	Size of Blast Opening in Carburetter	Inches Blast Maintained in Superheater	Size of Blast Opening in Superheater	Average Length of Blow	Boiler Steam Pressure	Average Length Run	Seconds Purging Allowed	Chey Brick Spacing Carburetter	Chey Brick Spacing Superheater
					Inches Dia		Inches Dia		Inches Dia							
Detroit	Steam	2	No	30 Days	10'-16"	12"	10'-16"	8"	10'-16"	8	6	110	8	None	2 1/2	2
Fall River	Steam 800 Steam Turb	1	No	No	18"	12"	5"		8 1/2"		7	110	7		3	2
Grand Rapids	Steam	3	Slightly	Rarely	15"	12"	8"	6"	8"	6"	5	100	9	None	2	2
Laclede	Steam-Roy & Thacker	2-3	No	Daily for Repairs	20"	16"	7"-10"	12"	None		4-5	110-140	5-6	5-10	2-2 1/2-3	2-2 1/2-3
Lowell	Steam	2	Yes	90 Days	9"	12"	9"	8"	None		4	110	5	None	2 1/2-3	3
Lynn	Steam	2	No		14"	8"	6"	6	3"	6"	5	80	6	None	3	2
Milwaukee	Steam	2	No	3 Weeks	11"	16"	10"	10"	6"	10"		125		None	2 1/2	2
New Haven	Steam Electricity	1 1/2	Yes	24 Hours	18"	12"	6"		6"		4 Feet 3 Coal	125	7	None	2	2
New Orleans	Steam	2	Yes	Daily for Repairs	14"	12"	14"	8"	14"	8"	4	105	6	90	3 1/2	3
Springfield	Steam	1	No	Seldom	12"		3"				3	80	7	3	2 1/2-3	2-2 1/2
Suburban of Phila	Steam Turbine	2	No	Only when Shutdown	14"	12"	8"		8		3	125	5		3	2
A	Steam	1	Yes	24 Hours	16"	12"	5"	25 square	None		4	115#	6	30	2 1/2	2 1/2
B	Steam	1 or 2	No	Only when Shutdown	12"	10"	6"	6	None	6"	5	120	7	None	2 1/2	2
C	Steam	2	No	24 Hours	15"	12"	8"		None		4 1/2	120	6		2 1/2	3
																Table #5

TABLE NO. VI

10'0" Machine

Name of Company	Number	Average Daily Make	Kind of Fuel	Average Depth of Fuel Bed	Pounds Fuel per M.	Kind of Oil from	Gravity in Degrees Baumé	Kind of Spray	Gallons of Tar per 100 Gal of Oil	Temp of Gas at Inlet to Pure Tyre in Summer	Temp of Gas at Inlet to Purifiers in Winter	Gas Carries	Do you increase Oil in Winter?
Detroit	2	1800000	R.H Coke	8'0"	33	Indiana	35	Watering Center Spray	8	75-85	75-90	Well	Yes
N	2	900000	Hard Coal	7'0"	33	Pennsylvania	36	Center	12	80	60	Well	
Laclede	2	6180000	R.H Coke	8'6"	30-35	Kansas	32	Watering Center	12.4	80-100	70-90	Blower 1 1/2 lb	Yes
Portland	3	1814000	Water Gas Oven Coke	6'0"	34.17		17-26	Center	14.6	80	60	Blower 2 lb	
T		70000	Hard Coal	8'0"	36.63	Indiana	36-38	Center	7 to 8	80	60	Blower 1 1/2 lb	Yes

Name of Company	Water Power for Producing Blast	Nº Charges made in 24 Hours	To Edging in Generator Possible max	Pull off Fire from Generator every	Inches Blast Maintained in Generator	Size of Blast Opening in Generator	Inches Blast Maintained in Carburetter	Size of Blast Opening in Carburetter	Inches Blast Maintained in Superheater	Size of Blast Opening in Superheater	Average Length of Blow	Boiler Steam Pressure	Average Length Run	Seconds Purging Allowed	Chey Brick Spacing Carburetter	Chey Brick Spacing Superheater
					Inches Dia		Inches Dia		Inches Dia							
Detroit	Steam	2	Not with R.H Coke	30 Days	10"-16"	12"	10"-16"	10"	10"-16"	10"	6	80-110	9		2 1/2	2
N	Steam Electricity	1	No	90 Days	18"	16"	20"	8"	Do not Show	except standing	5	100	6	30	2 1/2	2 1/2
Laclede	Steam-Roy & Thacker	2-3	No	Daily for Repairs	20"	16"	7"-10"	12"	None		4-5	110-140	5-6	5-10	2-2 1/2-3	2-2 1/2-3
Portland	Steam-In Pentstocks	1	Yes	60 Days	24"	16"	12"	8"	8"	6"	8	120	7	None	4	3
T	Steam	2	No	10 Days	14"	16"	10"	8"	8"	8"	8	100	8	None	1 1/2	1 1/2
																Table #6

of them came to hand, I have been able to little more than classify the data furnished.

Figs. 9 to 15 embody in curves the results of a series of experiments conducted by the writer at the Laclede stations. Before commenting upon the diagrams I should state that while certain general rules may be laid down, experience and study in St. Louis have shown that the water gas machines operated by the Laclede Gas Light Company are individuals, and must be treated as such to obtain the best results; as, for instance, a machine that works nicely under a 40-pound nozzle steam pressure will burn up on 25-pound, and *vice versa*. Therefore, to get the highest possible efficiency from a particular water gas machine, which of course means the greatest saving and least cost, it is necessary to know just what that machine is turning out under different conditions of operation.

Fig. No. 9.—The presence of carbon monoxide in blast gases indicates incomplete combustion and consequently waste of fuel. While of course theoretical values are practically impossible, an occasional analysis of blast gases will enable one to regulate the blast pressure and time of blow, so that the waste is a minimum. Plate No. 9 shows the relation between carbon monoxide and carbon dioxide each minute during a 6-minute blow.

Theoretically 1,000 cubic feet of uncarburetted gas weighs about 42 pounds and contains 17 pounds of carbon, therefore the difference between 17 and the pounds of fuel used in making 1,000 cubic feet of water gas must be accounted for. Let us assume that X lb fuel is required to bring the carburetter and superheater to their proper temperatures, that Y lb fuel is lost in the form of clinkers and ash, then the difference between 17 lb + X lb + Y lb and the pounds of fuel used is fuel wasted.

If our blast gas contains but 1 per cent. of CO, we waste a make of 1,600,000 cubic feet of water gas approximately 2,000 pounds of coke, considering coke 85 per cent. carbon. This reduces to 12.5 pounds

TABLE NO. VII.

Name of Company	Number	Average Daily Make	Kind of Fuel	Average Depth of Fuel Bed	Pounds Fuel per M.	Kind of Oil from	Gravity in Degrees Baumé	Kind of Spray	Gallons of Tar per 100 Gal. of Oil.	Temp. of Gas at Inlet to Purifiers in Summer	Temp. of Gas at Inlet to Purifiers in Winter	Gas Carries	Do you increase Oil in Winter
						11'0" Machine.							
Detroit	1	1800000	R.H. Coke	9'-10'	33	Indiana	35	Wheeling Steubenville Centre	8	75-85	75-90	Well	Yes
Indianapolis	1	1800000	R.H. Coke	9'0"	33	Indiana	36	Center	3	75-80	65		Yes
Kentucky Mfg. Co	2	1000000	R.H. Coke			Indiana		Center			65		
Laclede	5	6100000	R.H. Coke	8'-6"	30-33.0	Kansas	32	Wheeling Center	12.4	80-100	70-90	Brown & M.C.R.	Yes
Milwaukee	2		R.H. Coke	9'0"	30-32	Pennsylvania	33-37	Center	12	85	90	Well	No
New Orleans	2	2200000	Oven Coke	8'0"	35	Crude Louisiana	23	Center	12	84	81	Well	Yes
St Paul	2	1300000	R.H. Coke	7'0"-8'6"	33.38	Pure crude Ohio	42	Wheeling Center	12.50	74	69		Yes

Name of Company	Motive Power for Producing Blast	No Cleaning ings each 24 Hours	To Edging in Generator Troublesome	Pull all Fire from Generator every	Inches Blast Maintained in Generator	Size of Blast Opening in Generator	Inches Blast Maintained in Carburetter	Size of Blast Opening in Carburetter	Inches Blast Maintained in Superheater	Size of Blast Opening in Superheater	Average Length of Blow.	Boiler Steam Pressure	Average Length Run.	Seconds Purging Allowed	Chqr. Brick Spacing Carburetter	Chqr. Brick Spacing Superheater
						Inches Dia.		Inches Dia.		Inches Dia.						
Detroit	Steam	2	Not much Coke	30 Days	10"-16"	20"	10"-16"	10"	10"-16"	12"	6	80-110	9		2½	2
Indianapolis	Steam, Fay & Turbine	2	No	Only for Repairs	15"	16"	14"	10"	Very little		4	125	5	5	2	2
Kentucky Mfg Co	Steam	2	No	60 Days	15"	16"	13"	12"			10	95	12		2½	2½
Laclede	Mfg. m. Fay & Turbine	2-3	No	Only for Repairs	20"	20"	7"-10"	12"	None		4-5	110-140	5-6	5-10	2-2½-3	2-2½-3
Milwaukee	Steam	2	No	2 to 6 weeks	14½"	16"	14"	12"	8"	12"		125			3	2½
New Orleans	Steam	2	Yes	Only for Repairs	15"	16"	15"	6"	15"	12"	4	105	5	90	3½	3
St Paul	Steam	2	Yes	Only for Repairs	16"		10"		12"	-	4	95-100	6	30	2½	2½

Table No 7

TABLE NO. VIII.

Name of Company	Average Candle Power	Candle Power Determined By	Standard Used	C.P. per Gallon Oil p. M.	Observed B.T.U Gross	Specific Gravity	% By Volume CO_2	Ills	O	CO	H	CH_4	N
				General Chemical Data									
Aberdeen	21.00	Jet		5.50									
Austin	22.00	Jet		5.0									
Clenton	17.00	Jet		7.39									
Consumers Gas Co	26.00	Bar	Candles	5.0									
Detroit	24.75		Hefner	5.5-6.0	730		3.50	8.20	0.50	30.00	48.00	4.00	5.80
Elizabethtown	25.00	Bar	Candles	5.50									
Fall River	24.00	Bar	Edgerton	5.63									
Indianapolis	25.00	Bar	Candles Edgerton Methven Kilchaust	5.25-5.50									
Laclede	22.50-24.00	Bar	Candles	5.60	640 Net.	.6924	3.54	12.86	0.10	30.64	32.26	17.20	3.40
Lowell	20.00-25.00	Bar	Standard Edgerton	5.00			3.40						
Lynn	23.00	Bar	Candles	4.15									
New Haven	25.89	Bar	Candles Pentane	5.85		.630	3.00	11.50	0.80	28.50	30.00	21.00	4.20
New York Richmond	22.60	Bar	Candles	5.37			2.70	10.30	0.50	32.30	39.78	13.01	1.41
Nyack	20.00	Jet											
Oneonta	20.00			4.0 to 4.5									
Oskaloosa	20.00-22.00	Jet		4.0 to 5.5									
Pittsfield	25.00	Bar	Candles	5.9									
Portland	22.73	Bar	Standard Edgerton	5.47			3.70	9.70	1.10	26.30	35.55	17.40	6.25
Springfield	22.50	Bar	Candles	5.40									
St Paul	24.00	Bar	Candles	5.33-6.10		.625	4.40	12.50	0.70	29.40	32.40	15.30	5.50
Suburban of Phila	22.00	Bar	Pentane	5.80	630		3.60	11.60	0.40	30.50	29.90	22.00	2.60
A	22.80	Bar	Pentane	6.02			2.80	11.20	0.70	33.00	29.20	19.90	3.20
B	26.00	Bar	Edgerton	6.02									
C	20.70	Bar	Candles	5.35			4.00	10.10	0.50	28.00			
D	23.00	Bar	Candles	6.10-5.30									
E	21.00	Bar	Candles	5.50									
F	24.00	Bar	Edgerton	4.80-5.20									
G	22.50	Jet		5.50									
H	24.00	Bar	Candles	5.75			3.00	13.00	0.80	30.70	33.50	15.0	6.00
K	20.00	Bar	Candles	4.80			3.00	5.00	0.50	30.00	40.00	22.00	0.50
L	22.25-23.50	Bar	Edgerton	5.29	620	.626	2.90	11.30	0.80	30.50	32.98	15.19	6.33
M	22.1	Bar	Nigand	4.80									
N	20.0	Jet		4.80									
O	20.0	Bar		5.00									
T	23.0	Bar	Candles	5.00									

Table No 8

generator fuel per 1,000. On the same make 10 per cent. of CO represents 20,700 pounds of coke, or 13.8 pounds per 1,000. Approximately correct values for percentages between may be determined by interpolation. I have introduced these concrete numbers, not because I think it possible in practical operation to completely oxidize all the blast gases, and at the same time realize the proper temperatures, but to emphasize the effect even a small percentage of CO in blast gases has upon costs and the saving effected by machines so designed and so operated that the greater part of the available heat units is not wasted, but does useful work. The effect of too long a blow may be seen on the diagram, which shows the constantly increasing percentage of CO, and indicates that the machine should have been in such shape that the blast could have been taken off at the end of the fourth minute.

Our best results have been obtained on hot generators and carburettors with cooler superheaters, which combination is not easily maintained, since the fire tends to weaken, while the superheater tends to heat up as the day goes on. The blast should be introduced in such places, and of such volume and intensities, that the proper heats are obtained before the ratio of CO to CO_2 becomes about as 1 to 2. I have no data on the subject, but I believe we could more easily control the heats in the 3 shells if, in addition to the blast at the grate, we could by the introduction of varying volumes of air, at or near the top of the fuel bed, burn at this point more or less of the gases given off.

Figs. 10 *and* 11.—I will not attempt any discussion on the deleterious effect of nitrogen and carbon dioxide on the illuminating and heating value of gas, as I think there will be no objection to the assumption that, the other constituents remaining proportional, the illuminating and heating value of gas is higher or lower according to the percentage of carbon dioxide and nitrogen—that is to say, the less carbon dioxide and nitrogen, the better the gas.

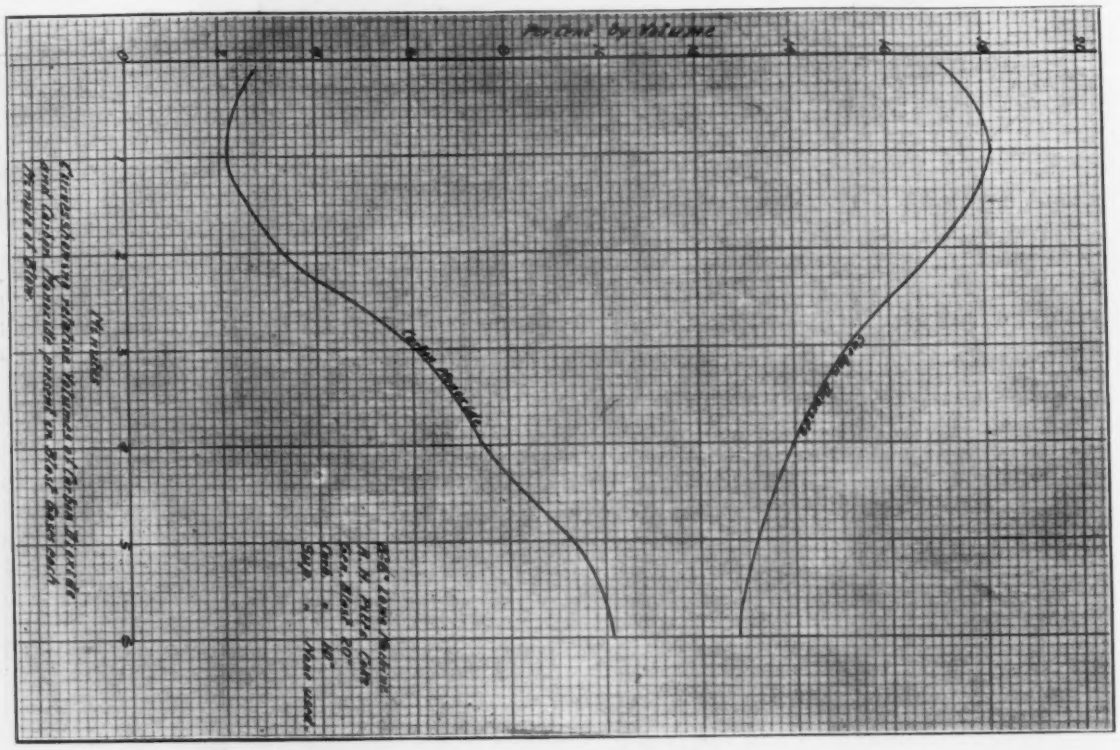


Fig. 9.

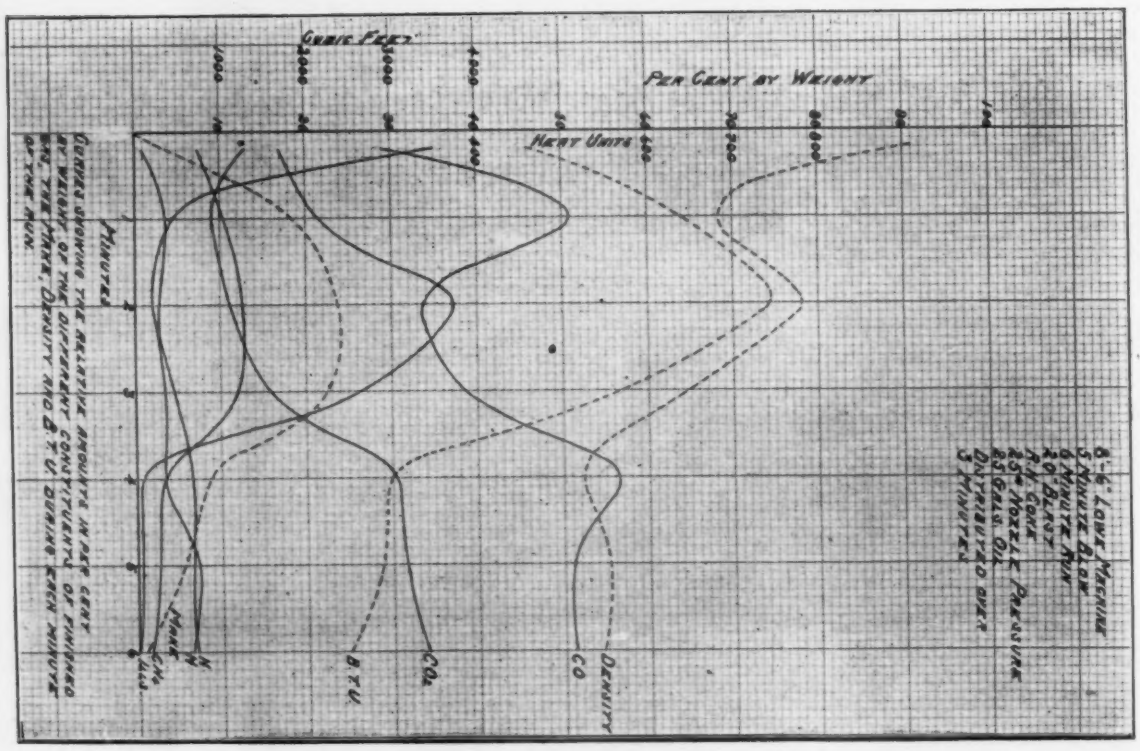


Fig. 10.

Figs. 10 and 11 show curves plotted according to per cent. by weight, and are introduced to illustrate:

(a) The importance of starting and taking off a run at the proper time, for the charts show the ratio of CO_2 and N to make to be much larger during the first and last minute of a 6-minute run than at any other interval.

(b) The effect of the rate of introducing oil on the quality of gas and the benefit derived from regulating the flow so that it will be distributed over the runs in amounts proportional to the make of blue gas.

(c) The desirability of taking off the run as soon as the oil has been broken up and passed through the superheater.

(d) The necessity of an ample relief holder, provided with a separate inlet and outlet, and large enough to permit a thorough mixing of the gas made during successive intervals, which is shown by the widely varying ratios of constituents to make at different points of the run. Both these charts indicate that to obtain maximum quality with quantity the run must be short.

Figs. 12, 13 *and* 14.—The experiments illustrated by Figs. 12, 13 and 14 were made to determine whether any steam passed through the fuel bed without being decomposed; and if so, the effect of different nozzle pressures upon the quality of the gas as well as upon the quantity of the undecomposed part of the steam. That a greater nozzle pressure affects the quality by increasing the percentage of CO_2 is evident from Fig. 12; that it increases the quantity of the undecomposed steam is shown on Fig. 13. Fig. 13 also shows the probable saving to be effected by gradually cutting the nozzle pressure during the latter part of the run, when the amount of undecomposed steam increases very rapidly; and Fig. 14, showing grams of water per cubic foot of blue gas, illustrates the advantage of reducing the nozzle pressure during the day. It is highly improbable that any considerable proportion of this undecomposed steam will be broken up in the carburetter and superheater after having passed through the higher heat of the generator,

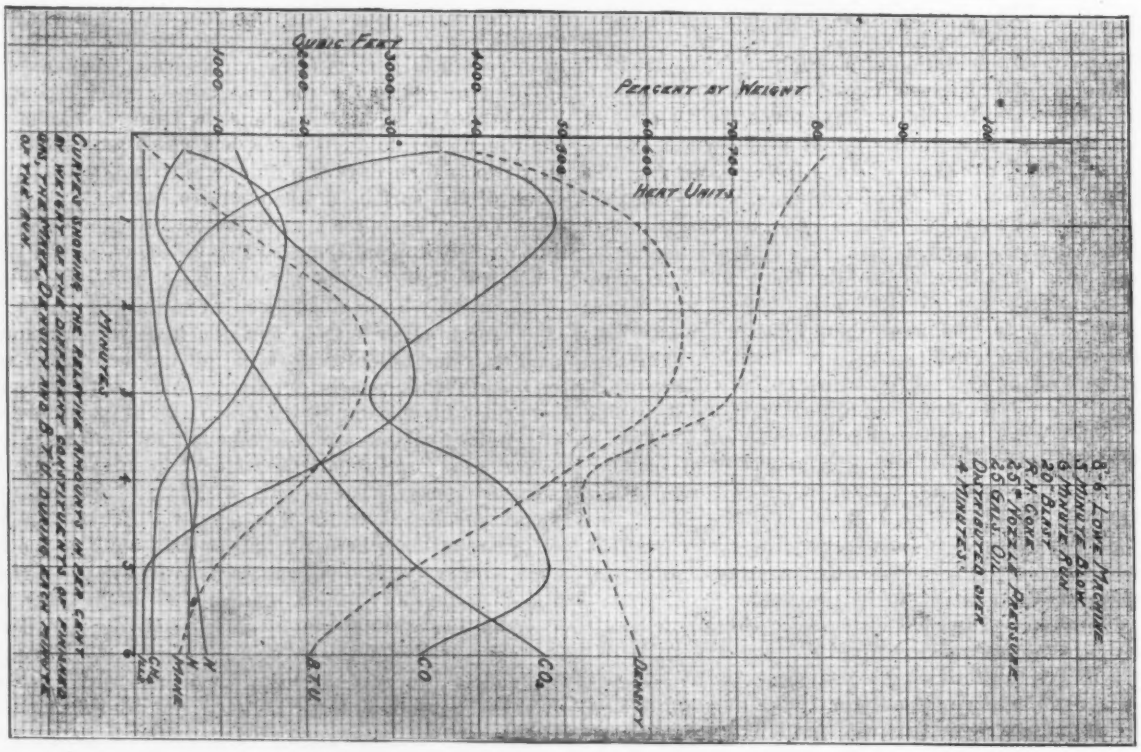


Fig. 11.

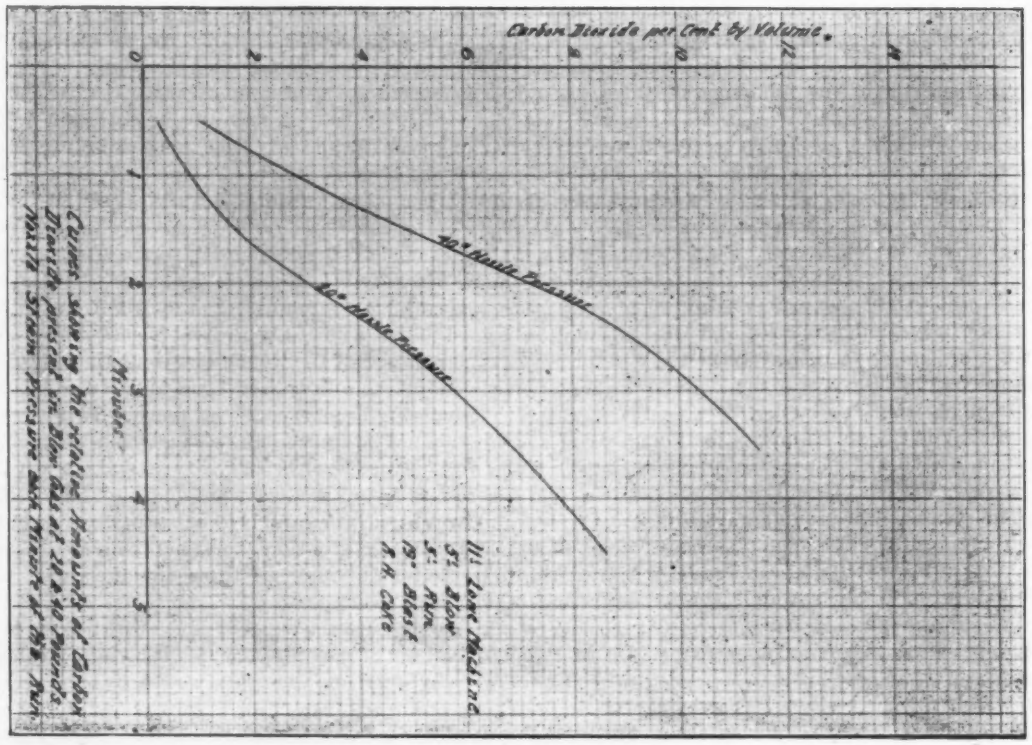

Carbon Dioxide per Cent. by Volume.
Minutes
40" Nozzle Pressure
20" Nozzle Pressure
Curves showing the relative Amounts of Carbon Dioxide present in Blow Gas at 20 & 40 Pounds Nozzle Steam Pressure and Marsh at the Run.
111 Lowe Machine
5½ Blow
5½ Run
20" Blast
R.N. Gore

Fig. 12.

but will change to water when it reaches the seal pot, which means waste and loss of both generator and boiler fuel. The loss in boiler fuel alone is surprising, as shown by the following table:

Nozzle Pressure 20 Pounds. Grams Water Per Cubic Feet Blue Gas.			
Number of run	1st-3d	2d-3d	3d-3d
4th after cleaning	1.21	2.08	7.41
20th after cleaning	1.54	2.21	
30th after cleaning	2.11	3.06	10.91
Totals	4.86	7.35	18.32
Averages	1.62	2.45	9.16
Average cubic feet gas made	4,810	5,500	3,150
Total grams water	7,792	13,475	28,845

Total average grams water per cubic foot blue grass, 3.73.

With a constant nozzle pressure of only 20 pounds, at least 3.73 grams of water is present as entrained steam in every foot of gas that leaves the generator. This means 16,500 pounds of water on a make of only 2,000,000 cubic feet, which, figured on an evaporation of 5 pounds of water, reduces to 3,300 pounds, or nearly 2 tons of wasted boiler fuel. This amount, taken in connection with the extra generator fuel that has been used in superheating this steam, and that which must be used to overcome its cooling effect, is a considerable item in the course of a year.

(To be Continued.)

A New Use for Coal Tar: Important Information--Four Years' Results with Tar Coating Streets to Eliminate Dust.[1]

By Dr. Guglielminetti, of Monte Carlo and Paris.

Four years have passed since the publication of our earliest successes with tar coating streets and roadways at Monaco and Paris. At firs this method of treating roadways gave rise to some misgivings on part of tar and asphalt experts, and especially among street engineers, who doubted that a thin coating of tar upon the surface of much used road-

1. From the *Journal Fur Gasbeleuchtung*. Prepared for the American Gas Light Journal by Mr. Frederic Egner.

ways would for weeks—not to say months—be able to successfully resist the formation of street dust.

To-day, after four years of observation of a number of kilometers (1 kilometer = .621375 of a mile) of streets tarred in the manner hereinafter described, the French street engineers have given their verdict on the subject, and in order that all countries might profit by the experiments made in France, and for the sake of street hygiene, we give this abstract of the report concerning tarring of roadways, which was published in the "Annales des Ponts et Chaussees" (No. 39, 4me trimestre 1905, Editeur Bernard, 1 Rue Medicis, Paris).

Mr. Heude, Engineer of the Departuent of the Seine and Marne, reported that he tarred, in the summer of 1903, about 215,200 square feet; in 1904, twice as much; and in 1905, more than 1,291,200 square feet; and he asserts that the results were, throughout, excellent. The dust resulting from the wear of the streets had almost entirely disappeared, and naturally the "wear" itself was enormously reduced, which meant longer duration. That, together with the reduction in cost for maintenance, more than pays the first and subsequent cost of installation of the street tarring apparatus. And, whereas formerly the sprinkling and cleaning of the streets cost considerable sums, this method actually caused a net profit of 1 cent per square meter (= 10.76 square feet) for the year. It is by no means any longer an experiment, but the method has been demonstrated to be practical. During summer there is little dust and in winter but little mud. From now on all newly made streets and roadways will be tarred.

Engineer Sigault makes the following statement: As the best evidence of the excellence of the new method, it may be mentioned that the residents of our communes request its use, and willingly volunteer to share in the first cost of its installation. The method was somewhat rapidly introduced. In the year 1902 but three of my Superintendents commenced the tarring, while now eight of them are doing it. He speaks of the following decisive experiment: A much used roadway was made over for a distance of 3,608 feet in 1902. For a distance of 1,640 feet this roadway was tarred then, and in the following three years. At the end of 1905 the tarred end of this road was in still entirely good condition, while the portion which was not so treated had to be recovered in the course of the year 1905. Another experiment: Two adjoining identically conditioned portions of a roadway, each having an area of 1,100 square meters, were newly covered in 1902. One of these sections of road was tarred, the other not. The following winter the untarred section had to be swept nine times, the tarred one only once. From the untarred section 24 cubic meters of mud had to be removed; from the tarred one only 2 cubic meters, and this was mostly brought on to it from the adjoining sections. With the view of preserving the roadway the section having to bear the heaviest traffic was tarred. These two experiments were convincing.

Mr. Girardeau, of Fontenay-le-Comte, claims, after many years of experience with the system, a saving of 25 per cent. in maintenance of streets by means of it. Mr. Vasseur, City Engineer, of Paris, had about 50,000 square meters of streets surrounding Parc Monceau, tarred, and is very pleased with the results. No one these days complains about insufficient sprinkling of the street, and the residents can again keep their windows open all through the daytime. Mr. Arnaud, Engineer of the Department of the Seine, considers the tarring of the streets as a most excellent and practical means to suppress the dust of the streets.

Streets around Paris, which formerly—that is, before the tarring—required re-covering every three or four years, were tarred during the summers of 1903, 1904 and 1905, and are now in such good condition that there will be no need to re-cover for some years to come, and one year's postponement would richly pay the cost of all the tarring.

The method to do this may be gathered from the brief description, of which the following is a free translation: In the heating wagon the cold tar is poured into a vessel, over which is situated a large heating kettle, which is a closed vessel like a boiler, and is connected with a small steam boiler. The arrangements are that steam may be blown direct into this heating kettle or boiler; or, if desired, can be conducted into spiral pipe coils inside of the same kettle.

The kettle is first filled directly with steam; then cold water is poured over it, causing the steam to condense, and the resulting vacuum will draw about 1,000 liters (about 264 gallons) of cold tar up into the heating kettle, through a pipe which connects the same with the tar reservoir on the wagon. Now steam is admitted into the coils mentioned and the tar is brought up to a temperature of 100° (no doubt Centigrade, or about 212° F.), and at the same time steam is also admitted into the kettle direct, by which means the boiling tar is forced down and through a pipe into the sprinkling wagon standing alongside. As soon as the heating kettle is empty the steam is again condensed as before, and the operation repeated as often as may become necessary. It is evident from the official reports from which we have quoted that tar is a very different means to lay the dust than certain other costly makeshifts have proved to be, as, for instance, westrumit, simplicit, rapidit or other oils which are soluble in water, but which are effective to lay the dust only two or three days at a time, while tar brings about a sort of hardening of the surface of the roadway, which is very desirable for the traffic on macadamized streets, especially where a sort of tar asphalt is thus formed, as pointed out by Privy Councillor von Leyden.

While in these days of "automobilismus" a somewhat durable good effect can only be obtained by either sprinkling the roadways so heavily as to form mud, or else to sprinkle lightly every hour, which tends more or less to hinder free traffic on the sections of road undergoing treatment for the time being, tarring reduces the dust nuisance to an inconsiderable minimum, for which a light sprinkling twice each day will suffice to obtain a real satisfactory result.

No mud is formed upon the water-tight surface any more than with asphalted streets. Tar asphalt will last about 8 to 10 months, while asphalt pavement will last 8 to 10 years. But the latter costs 15 francs per square meter, whereas the tar asphalt costs only one hundredth as much, and even this small sum is recovered in the saving by lesser cost in maintenance and wear of roadway. This advantage from a financial viewpoint has overcome many an engineering official objection when the hygienic advantages were entirely ignored. Very likely it was also the financial aspect of the matter which caused more attention to be given to the mechanical means to accomplish the work, and the former primitive method of heating the tar, and then by means of hand sprinkling cans, brooms and much labor, to spread the tar heated up to about 70° evenly over the surface of the roadway, has been now superseded by the large tar heating wagon in which 264 gallons of tar can be heated every 20 minutes by means of steam and without danger of taking fire, and pumped over into the sprinkling wagon, on the rear end of which large mechanically moved brooms spread the tar over the surface of the roadway. In this manner more than 107,600 square feet can be tarred inside of 4 hours. The tar sprinkling wagon carries a large barrel out of which the tar flows into a basin in which the pressure is always the same. From this basin the tar flows into a distributing pipe with holes, calculated on the distance of a horse's step, and that in such distance about 600 grammes of tar are distributed over each square meter of surface (1.32 pounds tar to each 10.76 square feet). Since 2.64 pounds, or 1,200 grammes, are required per each square meter, to make a good job of it, the same ground is passed over twice. As the brooms at the rear end of the wagon distribute the tar automatically, one laborer is enough to follow the wagon to fill in possible vacant spaces which the revolving brooms could not reach. To insure the best results the work should be done during clear, warm weather; the roadway should be well cleaned and perfectly dry; 2 and a scant ¾ pound of tar to every 10¾ square feet of roadway, put on as hot as possible, and well spread, and over all a little sand is to be sprinkled. One-half of the street (in width) is tarred at a time, and then the tarred portion should be closed to traffic for 24 hours. If these directions are followed the success of the work is assured.

To partly meet the expense of the first time of tarring a roadway, the financial aid of the public, which is certainly interested in the highest degree by this improvement, would be desirable. Owners of hotels, shops, and tradesmen of all sorts who are more or less affected by the dust nuisance; physicians and others who may well find it to their advantage to see a system inaugurated which will positively eliminate dust from streets and roadways, ought to get together and use such means as they can command to bring about this really possible and so greatly desirable result. If these lines contribute anything to further the good work their object will be accomplished.

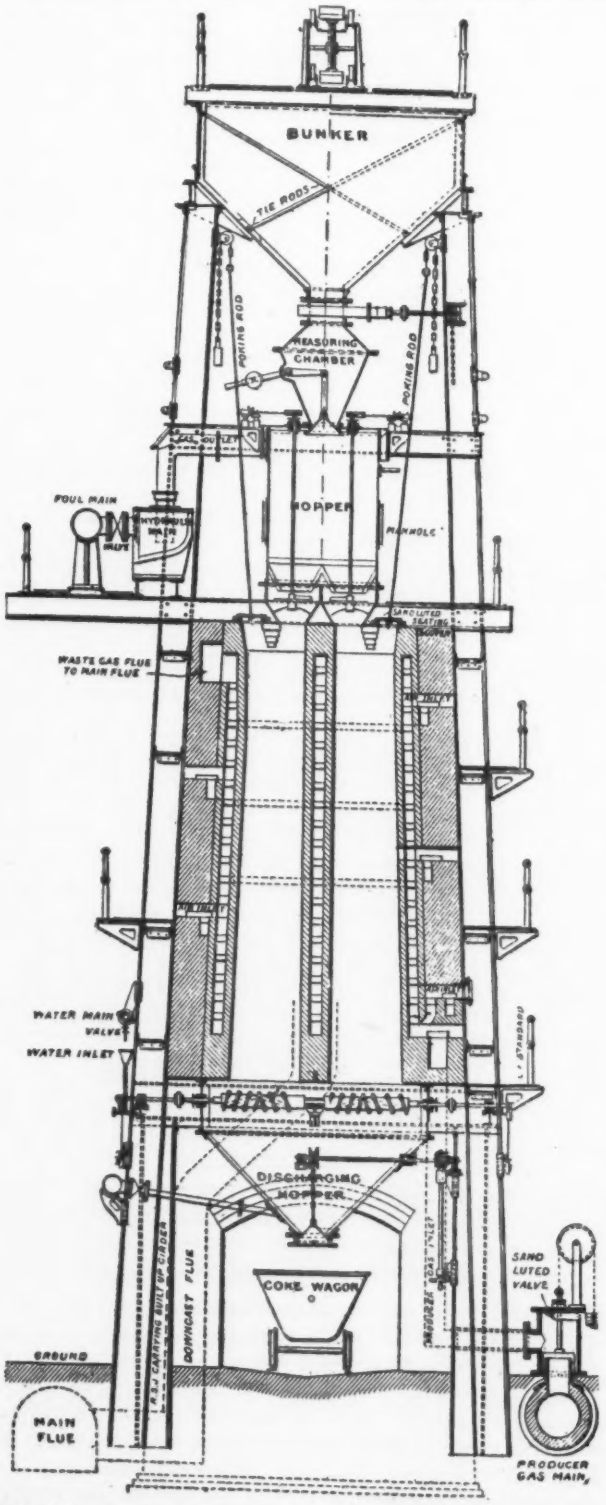
To these words the translater beg leave to add a suggestion or two. Owners and users of automobiles or carriages of any sort might be added to the list of those who are interested in seeing the street dust laid; so are pedestrians who are obliged to walk either for business or pleasure. And last, but by no means least, the tar producers should take a little trouble to bring this subject before the people who suffer by reason of the dust nuisance, and to the notice of the officials who can—now that a way has been shown by such good authority as is herein quoted from—lay the dust.

Railroad companies also might find it to their financial interest as well as greatly to the comfort of their passengers and other patrons to give this method of dust prevention their serious and favorable consideration, and in this connection they might take notice that coal tar is not exactly a fertilizer, but quite the contrary, and by a light occasional

sprinkling of their roadbeds weeds would be annihilated and kept away, and iron as well as wood coming under the tar sprinkler would experience a lengthening of life and usefulness, much to the financial advantage of the railroad company who may give this recommendation serious thought.

Young and Glover's Vertical Retorts.[1]

It will be remembered that, earlier in the present year, Mr. William Young, of Peebles, contributed a series of articles to the *Journal* on the subject of "Vertical Retorts for the Production of Illuminating Gas." In the course of the fifth article, which appeared in the number of April 17 (p. 163), Mr. Young enumerated various principles which he



stated might be applied to the carbonization of coal for the production of gas; and he promised to send for early publication a sketch of the type of setting which he considered would best meet the requirements of the case. We are now able to supplement these remarks by giving an illustration of the vertical retort setting which he and Mr. Glover have designed for this purpose.

1. *Journal of Gas Lighting.*

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by Royal E. Burnham, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 10 cents.

824,786. Gas purifier. Perry E. Hall, Jr., Everett, Wash.

824,883. Gas producer. Josef Reuleaux, Wilkinsburg, Pa.

824,933. Safety valve for gas pipes. Adolph W. Jenczewsky, Chicago, Ills.

824,934. Safety valve for gas pipes. Adolph W. Jenczewsky, Chicago, Ills.

824,935. Safety valve for gas pipes. Adolph W. Jenczewsky, Chicago, Ills.

824,956. Depurator for gas. George G. Smith, Florence, Italy.

824,972. Gas burner. John F. Borne, Silver Creek, N. Y., assignor to Hammond-Homburger Company, same place.

824,999. Gas analysis apparatus. John M. Morehead, Chicago, Ills.

825,064. Valve for gas generators. John Levey, Chicago, Ills., assignor, by mesne assignments, to John Williamson, same place.

825,187. Attachment for prepayment gas meters. Louis T. Bulley, New Haven, Conn.

825,234. Process of producing calcium carbide. John M. Morehead, Chicago, Ills.

825,297. Process of extracting ammonia from gases. Rudolph Brunck, Dartmund, Germany.

825,324. Wet gas meter. John Oswell Jones, St. Louis, Mo.

825,399. Fluid meter. Frank Lambert, New York City.

825,451. Statement delivery mechanism for meters. Richard W. Gallagher, San Francisco, Cal., assignor to Automatic Meter Company, same place.

825,607. Gas heater and evaporator. Paul S. Murta, Philadelphia, Pa.

825,707. Meter connection. Samuel L. Eastey, Winona, Minn., assignor of one-half to Wm. H. Brust, same place.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

IT is said upon good authority that Gov. Guild favors the abolition of the Massachusetts Gas Commission, to be succeeded by a single-headed Board, with the newly-named Commissioner, Alonzo R. Weed, of Newton, at its head.

THE Humphrey Company, of Kalamazoo, Mich., has issued a fine illustrated catalogue of their instantaneous and automatic gas water heaters.

NOW it is Woonsocket, R. I., that wants its Gas Company examined, and Council passed a resolution to employ an expert. It is to be hoped they will get such and not a claimant only to such title.

SIX suits will soon be filed against the Denver City Tramway and the Denver Gas and Electric Company against the validity of its franchise, recently obtained, two of them to be in the United States Court in equity proceedings. One good suit would be something to fear, but six poor ones helps the legal profession more.

FOR the purpose of encouraging the use of gas for cooking purposes, the Helena (Mont.) Light and Railway Company announces that it will make a discount of 25 per cent. provided the bill is paid on or before the 10th of each month at its offices.

NEGOTIATIONS are now under way between Samuel Hunter, of Shreveport, and two Northern syndicates looking to supplying New Orleans, La., with natural gas for illuminating and fuel purposes.

THE Westchester (N. Y.) Lighting Company is gradually closing down its subsidiary plants and is steadily increasing its generating plant at Mount Vernon, near Eastchester. The next plant that will succumb to this centralization is the one at Rye, N. Y.

THE Stoughton (Wis.) Common Council has passed an ordinance to permit the Warren & Pettigrew Company to erect and maintain a gas plant in that city. The corporation agrees to begin work not later than June 1, 1907. The city reserves the right to purchase the plant in 30 years.

THERE seems to be good reason to believe that some sort of a consolidation has been effected by the recently formed Wichita Natural Gas Company and the old Company now supplying artificial gas to the people of Wichita, Kas., and that when the pipe line of the new Company reaches the city limits it will be connected with the mains of the Wichita Gas, Electric Light and Power Company.

THE Morristown (N. J.) Civic Association suggests that in any new contracts made the companies should furnish gas to private consumers for not more than $1.25 per 1,000 feet, and electricity for not more than 15 cents per kilowatt. The present price of gas is $1.75 per 1,000.

THE York (Pa.) Gas Company stock, which has a par value of $50 per share, but which is now selling at $100, has been offered to the stockholders at $25. Recently it was discovered that there was a large fund in the treasury for disposition to the stockholders. The Company needed money for its permanent improvements, it is said, and instead of making an extra dividend it was decided to issue stock to the stockholders at the above low price and keep the money in the treasury.

MR. R. G. HUNT has retired from the management of the San Diego (Col.) Consolidated Gas and Electric Light Company. Mr. Hunt will go to Chicago to fill a position in the home offiee of H. M. Byllesby & Co.

REFUSING to recognize the action of the city authorities in fixing the price of gas at 90 cents per 1,000 feet, the Saginaw (Mich.) City Gas Company has issued a statement to the effect that, pending the settlement of the suit just begun against the city, $1.20 will be charged for both fuel and illuminating gas, with a discount of 20 cents, making the net price $1. In case the courts decide the action of the city authorities is binding on the Company the excess paid by the consumers over the 90-cent rate will be returned.

MR. ADAMS, employed by the city of Fall River to investigate the Gas Company's service, is having a newspaper argument with the veteran Manager, Mr. Nute, of the Company, in which the latter is taking a few falls out of the former, which gas men could easily appreciate, but of which the public will understand little, and howl for Adams.

A PETITION signed by more than one-half the property owners of Greenville, Ills., praying that an ordinance be passed granting A. E. Dunn the right to lay and maintain gas pipes and mains, for a period of 20 years and fixing the rate at $1.50 per 1,000 cubic feet, was passed. Under the terms of the ordinance work must begin at once and the plant must be in operation by December 1st, unless prevented by unavoidable circumstances.

AT a special meeting held July 6, the stockholders of the Lawrence (Mass.) Gas Company voted to petition the Gas and Electric Commissioners for authority to increase the capital stock by 4,000 shares. The proceeds will be used for extensions and improvements. The price of the new shares is to be fixed by the Commissioners. The present amount of capital stock outstanding is $1,000,000, par $100.

GOV. STOKES, of New Jersey, signed Assemblyman Jones' bill authorizing cities to construct, acquire and operate electric light and gas plants. The bill, while particularly intended for Camden, is general in its application, and is looked upon by many as a step in the direction of municipal ownership in New Jersey.

THE city of Kokomo, Ind , on July 5th, brought suit in the Howard Superior Court to have the franchise of the Kokomo Gas Company declared void, and to enjoin the Company from using the streets and public grounds of the city in the distribution of gas. The franchise was granted in 1874, and it permits the Company to charge a maximum rate of $4 a 1,000 cubic feet for gas. The suit is the outgrowth of a long fight to force a concession on rates. It is alleged that the Company refuses to lay mains sufficient to supply gas to all patrons; that the franchise is unlawful because it grants rights in perpetuity and permits exorbitant charges, and that it is a trespasser on thoroughfares, in that it gives no heed to a resolution passed by the City Council six months ago repealing the franchise. A Pittsburgh company is offering to supply the city with 60-cent gas if the City Council will grant a franchise.

THE Greeley (Col.) Gas and Electric Company has been sold to the Federal Gas Company of Chicago. The plant will be moved from its present quarters outside the residence portion of the town. It will be enlarged but no practical change will be made in the management.

MR MAYNARD H. SPEAR, formerly Manager of the Williamsport (Pa.) Gas Company, returns to the Queens Gas and Electric Company, of Flushing, L. I., as its General Superintendent.

MR. C. F. POTTER, who was Superintendent of the Queens Gas and Electric Company, of Flushing, L. I., has been transferred to the Dallas (Tex.) Gas Company to hold an important position.

BY a unanimous vote of the City Council George W. Alt, of Chicago, was granted a franchise for the establisment of a gas plant in Waxahachie, Tex. Water gas will be manufactured and furnished patrons. Work is to be commenced on the plant about November 1, and it is to be completed and fully 5 miles of main laid within 1 year.

THE amended gas franchise, giving Havens & Potsford, of Olean, N.Y., the privilege to furnish gas to Union City, Pa., for 25 years at $1.25 a 1,000 cubic feet, passed unanimously. The firm must accept within two weeks, and start to work immediately. It is dubious as to whether a gas plant will pay in Union City or not.

THE ordinance granting F. W. Long and others a 25-year franchise to lay gas pipes in certain streets in Barry, Ills., was passed under a suspension of the rules.

J. C. PATRICK has resigned his position as Manager of the Portage Lake (Mich.) Gas and Coke Company and will go with the Empire Gas Construction Company, of New York. He will be succeeded at Hancock, Mich., by L. H. Curtis, of St. Louis.

JUDGE LACOMBE, in the United States Court, appointed Arthur H. Masten, one of the standing examiners of the Court, as special master to take testimony, make computations and report a finding on the facts in the suits brought by the Consolidated Gas Company, of New York, and its subsidiary corporations, to prevent the enforcement of the 80-cent gas law.

MR. DAVIS DOUGLAS succeeds Col. D. B. Dyer as President of the Gas Light Company, of Augusta, Ga. Mr. D. Schindler becomes Treasurer, Resident Manager and Purchasing Agent, and Marion R. May, Secretary. Mr. Joseph P. Eastman, as Consulting Engineer, will plan the new improvements to the works which will be greatly extended, and will be Superintendent of same.

THE Port Townsend Gas Works Company was not the organization referred to in a recent issue of the JOURNAL as in the hands of a receiver. This plant is quite solvent. The item referred to the Townsend Gas and Electric Company, a different organization.

THE Rutland (Vt.) Railway and Light Company has installed a Stroh & Osius ammonia still which is doing satisfactory work.

IN the United States Circuit Court a decision favorable to the plaintiff was handed down in the case of George W. Pepper, Receiver of the Bay State Gas Company, of Delaware, against Henry H. Rogers, of New York, in the suit to recover $3,000,000 alleged to be due the Gas Company in connection with the sale of the Boston (Mass.) Companies. The Court orders that the profits shall be apportioned by a master between Mr. Rogers and the Bay State Gas Company, of Delaware, but if no definite equitable rule is ascertained then the amount shall be apportioned, half to Mr. Rogers and half to the Gas Company. The Court finds that Mr. Rogers was guilty of no fraud. It also finds that he was guilty of no breach of trust so far as the making of contracts is concerned. Under the decision of the Court, which was written by Judge Putnam, Moorfield Storey ia appointed master for the purpose of making what he considers an equitable division of the $3,000,000 involved. If the master is unable to report what he considers an equitable division, then the Bay State Gas Company, through Receiver Pepper, shall receive at least $1,500,000.

THE Committee in joint session have recommended R. W. Hunt and Company, of New York, to make plans for the improvements for the Richmond (Va.) municipal gas works, but as this has to be confirmed by the Council, there may be another flop before any real definite action is taken.

THE Stamford Gas Stove Company marks another step in its active and progressive career by absorbing, with an increase of capital, the Yale Gas Stove Company, of New Haven, and sends us its list of officers containing 3 new names which will be recognized by most of our readers as a distinct gain to the executive force of this company. The new men are John J. Garrison, Treasurer, who for the past eight years has been Eastern Sales Manager for two of the largest gas range manufacturers of the Middle West, Harry L. Sterrett, Secretary, who was Manager of the Yale Gas Stove Company. Mr. E. B. Mooney, Assistant Treasurer, who has been 10 years Manager and Assistant Treasurer of the Brockton Gas Light Company. Henry J. Warren continues as President of the Company, and H. P. Goff, of Pittsburgh, as Vice-President. F. T. Lockwood is Assistant Secretary. The combination of these companies, under the energetic management of the gentlemen named, is sure to bring still brighter success and greater growth to this concern.

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NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, JULY 23, 1906.

The Market for Gas Securities.

On July 18 Judge Putnam in the United States Circuit Court handed down a decision in the $3,000,000 Bay State gas case favorable to the Bay State Gas Company of Delaware. The case decided by Judge Putnam was on the bill brought by Receiver Pepper, of the Bay State Gas Company, of Delaware, against H. H. Rogers, in which the plaintiff prayed that a decree be entered against H. H. Rogers ordering him to pay to the plaintiff the sum or sums received by him as trustee of the Bay State Gas Company, of Delaware, from the New England Gas and Coke Company. The directors of the Montreal Light, Heat and Power Company have increased the rate of dividend from 4 per cent. to 5 per cent. yearly. The first quarterly dividend of 1¼ per cent. is payable on August 15. A semi-annual dividend of $5 per share has been declared on the capital stock of Fall River Gas Works Company, payable August 1, 1906, to stockholders of record July 19, 1906. Stock transfer books will be closed on July 8 and will reopen on August 2.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

JULY 23.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	130	139¼
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	101	104
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	..	105
Mutual	3,500,000	100	225	250
New Amsterdam Gas Co.—				
Mtg. 5's, due 1948, J. & J.	11,000,000	1,000	103	105
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	..	98	104
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	101	103
New York and East River—				
1st 5's, due 1941, J. & J.	3,500,000	1,000	109	111
" 1st Con. 5's	1,500,000	..	104	110
Standard	5,000,000	100	140	160
Preferred	5,000,000	100	155	175
1st Mtg, 5's due 1931, M. & N.	1,500,000	1,000	111	114
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Brooklyn Union, Con. 5's, due 1948, M. & N.	15,000,000	1,000	120	130
Bay State	50,000,000	50	5/16	¾
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works	450,000	100	..	65
" 1st Mtg. 5's	509,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	9	10
" " Bonds, 5's	5,250,000	1,000	75	80
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	106¾
Cincinnati Gas and Electric Co.	29,500,000	100	103⅛	103¾
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	90	..
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	..	95
Preferred	3,026,500	100	107½	108
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	..	88½
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
" Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	..	..	100
Detroit City Gas Co.	5,000,000	50	..	50
" Prior Lien 5's	4,618,000	1,000	..	98
Detroit Gas Co., 5's	381,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	..	110	112
" Bonds, 5's	10,500,000	..	107½	108½
Indianapolis	2,000,000	..	60	70
" Bonds, 5's	2,650,000	..	104½	105
Jackson Gas Co.	250,000	50	82	..
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,892,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	..	105
Preferred	2,500,000	100	95	110
Bonds	10,000,000	1,000	104	104¼
Lafayette Gas Co., Ind.	1,000,000	100	..	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas & Elec. Co. " 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	85	87
Massachusetts Gas Companies of Boston	25,000,000	100	57⅛	57¼
Preferred	95,000,000	100	87	87⅛
Montreal, Canada	2,000,000	100	218	218¾
Nashville Gas Lt. Co.	1,000,000	100	110	..
Newark, N. J., Con. Gas Co.	6,000,000	..	56	58
Bonds, 6's	6,000,000	..	137	138
New Haven	2,000,000	25	200	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	89⅛	89¾
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	104½	105¼
San Francisco, Cal.	15,800,000	100	..	..
St. Joseph Gas Co. 1st Mtg. 5's	751,000	1,000	92	..
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and plans of Albert J. Weber, the President, whose portrait appears in the cut. The mechanical work is under the personal supervision of Mr. Jasson Porter Whittier, Superintendent of Construction for Adam Weber Sons. This contract was one of the largest ever given out in New England, and was closed by Mr Albert J. Weber in person. These benches will be charged and discharged by machinery controlled by electrical energy and fed by overhead coal bins.

The full plans and further illustrations of this great work will be published by the JOURNAL in the near future.

This construction has been visited lately by many eminent gas engineers, who have spoken very highly of the work.

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Amsterdam Gas Works, Holland	30.000	Coal Gas Make.
British Gas Light Co., Norwich	3,500	Oxide Revivification.
" " " " Etruria	30,000	General Works Meter.
" " " " Hull	1,500	Oxide Revivification.
Cleckheaton Gas Co	30,000	General Works Meter
Cleethorpes Gas Co	25,000	Water Gas Make.
Croyden Commercial Gas and Coke Co	3,500	Oxide Revivification.
" " " "	80,000	Carburetted Water Gas.
" " will install	180,000	General Works Meter.
Danish Gas Works, Fredriksburg, Denmark	100,000	Coal Gas Make.
Elstev Gasmeterfabric, Rotterdam, Holland	2,800	For Testing Meters.
Gas Light and Coke Co., London	5,000	Oxide Revivification.
" " "	3,500	" "
" " "	3,500	" "
Gas Anstalt, Hanover, Germany	100,000	General Works Meter.
Halifax Corporation	100,000	Ca buretted Water Gas.
Hastings and St. Leonards Gas Co	100,000	General Works Meter.
Hanover Gas Works, Hanover, Germany	100,000	" " "
Kidderminster Gas Light and Coke Co	60,000	" " "
Liverpool United Gas Co	10,000	Oxide Revivification.
Shanghai Gas Co	40,000	Carburetted Water Gas.
" "	75,000	Mixed Coal and Water Gas.
South Metropolitan Gas Co., London	5 each 10,000	Oxide Revivification.
South Staffordshire Gas Co	(70 with capacity from) (2,800 to 500,000)	Producer Gas.
Stockholm Gas Co., Sweden	100,000	Mixed Coal and Water Gas.
Worthing Gas Light and Coke Co	60,000	General Works Meter.

We have been permitted by the recipients, an American constructing concern, to reproduce the following letters recently received in reply to inquiry respecting Rotary Station Meters made of three important English gas works' engineers, all of whom enjoy enviable reputations and are everywhere among their fellow workers recognized for the skill, ability and success which has attended their administrations of the properties with which they are connected. The originals of these letters, together with many more of similar tenor, are on file in our office and open to the inspection of any prospective purchaser of Rotary Station Meters.

DEAR SIRS:

In answer to yours of the 27th March, I have pleasure in stating that we have had an 80,000 cu. ft. per hour Rotary Station Meter in use in connection with our Water Gas Plant for almost 18 months; during the greater part of this time we worked in series with our ordinary station meter, and found its registration accurate. I am so satisfied with it that I am about to place an order with the firm for a meter to pass 180,000 cu. ft. per hour of coal gas.

Yours faithfully, _____

DEAR SIRS:

In reply to your enquiry of the 27th March *re* Rotary Meter, I have not the slightest hesitation in stating that the meter we have in use here is giving every satisfaction.

It is 15,000 cu. ft. per hour and fixed at the outlet of Condensers of our Carburetted Water Gas Plant, and of course in the inlet of the Relief Holder, and is working under extreme conditions.

It is fixed underground, and since we have had it, *viz.*, 3 years, we have only taken it out once for examination (and this out of curiosity); as you will quite understand, there is a lot of oil, tar, etc., in contact with the meter at this point, and we thought it might be getting clogged up, but were pleased to find that such was not the case.

From our experience we have not the slightest hesitation in recommending its adoption to all gas makers.

I shall be pleased to reply further if necessary.

Yours very faithfully, _____

GENTLEMEN:

In reply to yours of March 27th respecting the Rotary Station Meter in use at these Works, I beg to inform you that the same has given every satisfaction. The meter has been registering the whole of the gas made at our Inclined Retort Section for the past 2½ years, and up to the present time we have not had the slightest trouble. The capacity of our meter is 100,000 cu. ft. per hour.

Yours truly, _____

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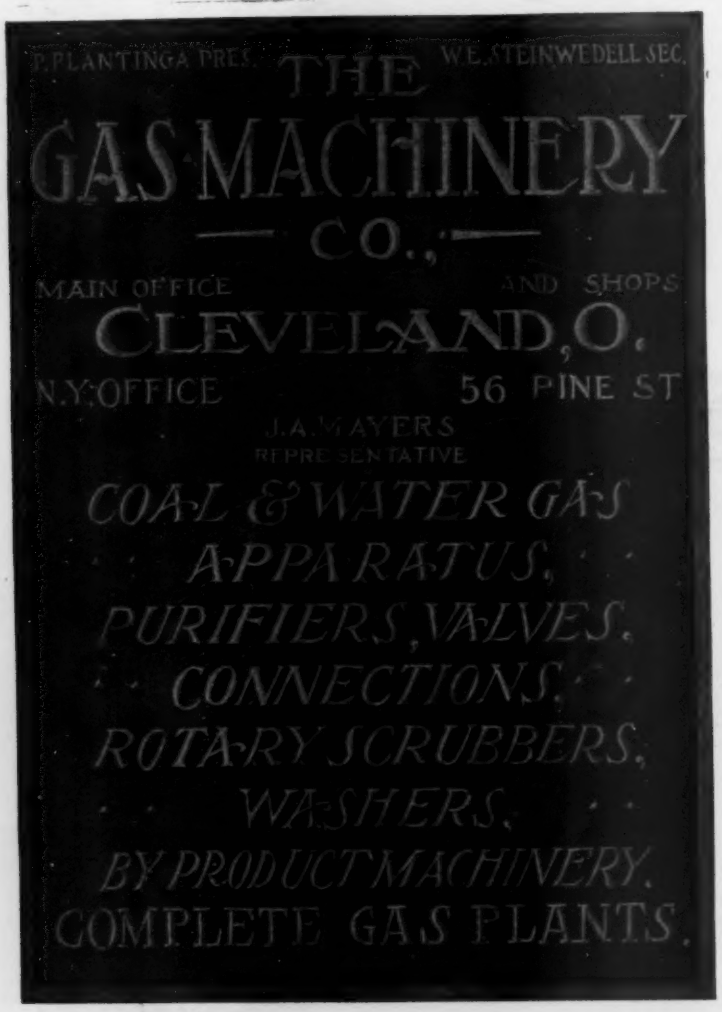

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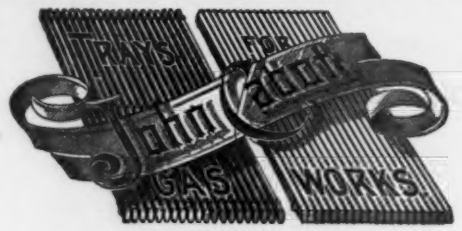

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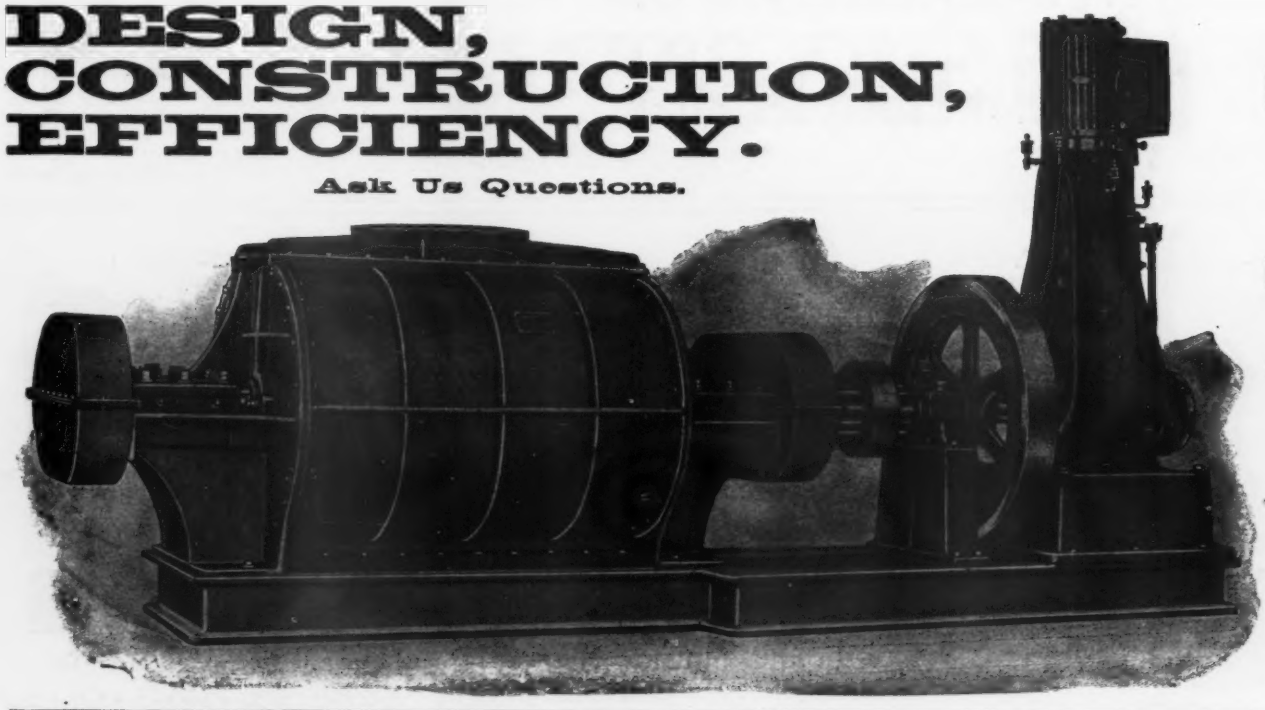

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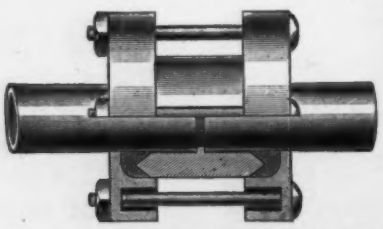
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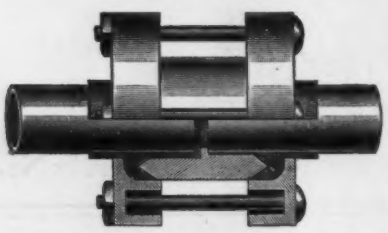
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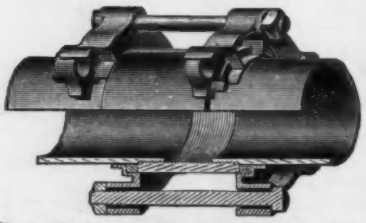
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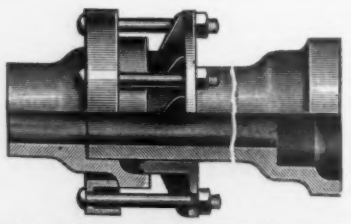
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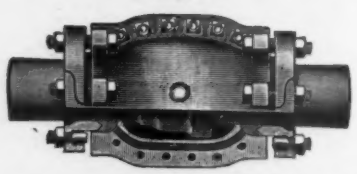
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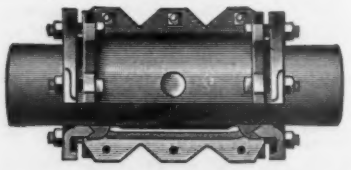
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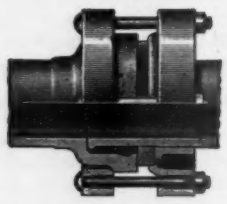
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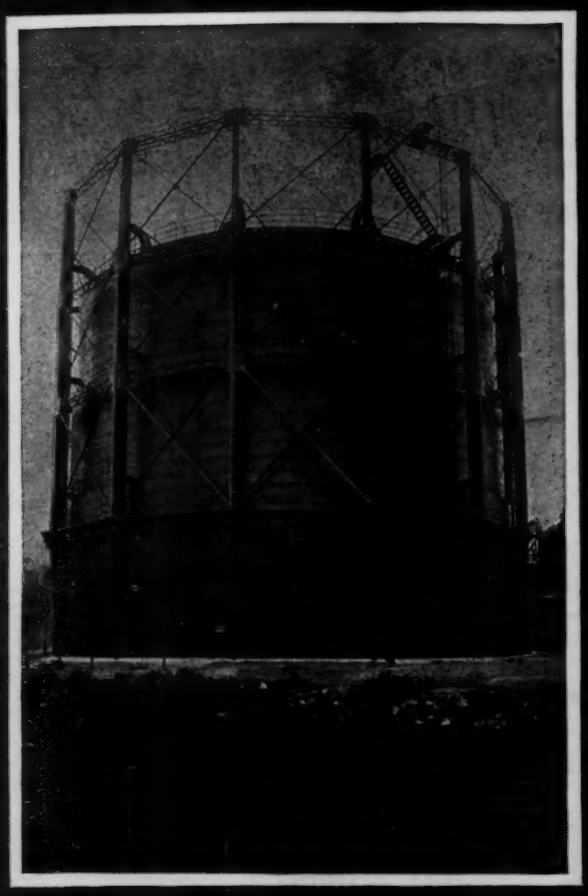

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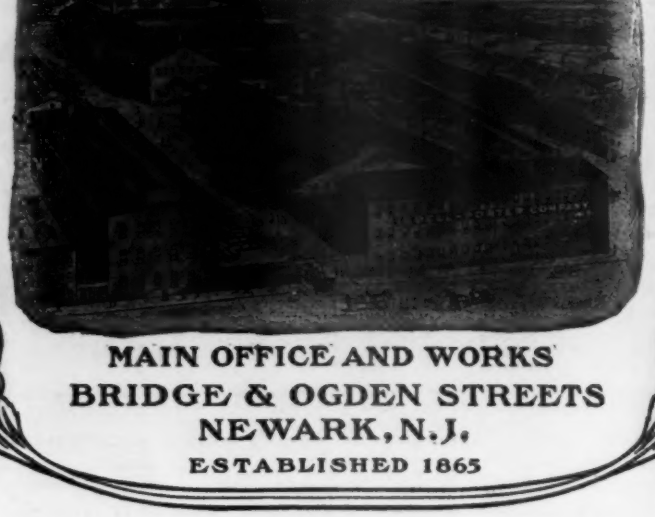

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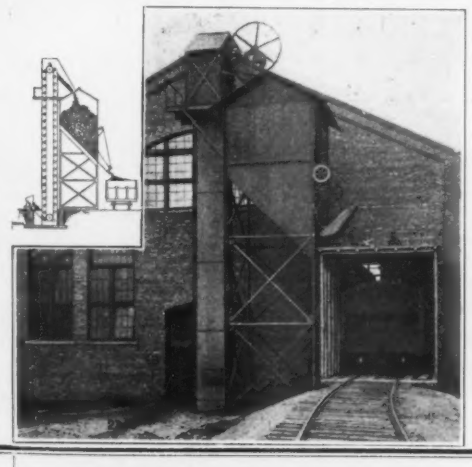

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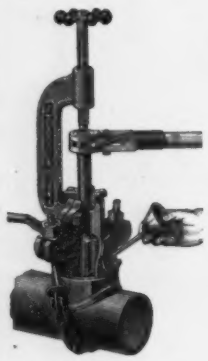

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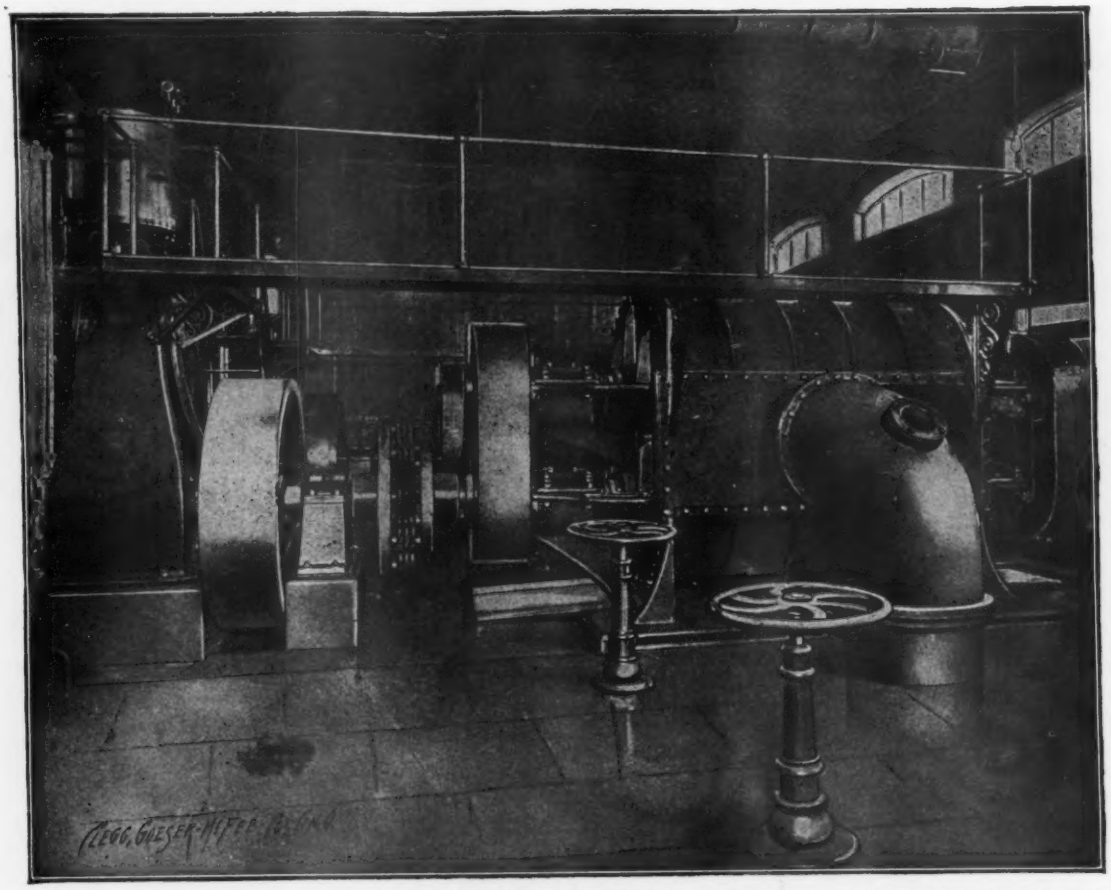

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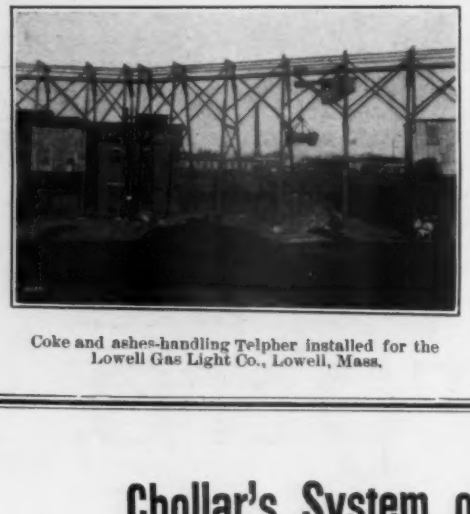


Coke and ashes-handling Telpher installed for the Lowell Gas Light Co., Lowell, Mass.

TELPHERAGE FOR GAS WORKS.

Telpherage is the best system ever devised for transporting material at gas plants; in utility, economy, and efficiency, it is rapidly demonstrating its superiority.

State your case and ask for booklet 53.

UNITED TELPHERAGE DEPARTMENT

The Dodge Coal Storage Co.

Philadelphia—Hunting Park Ave. and P. & R. Ry.
New York—49 Dey Street.
Chicago—39th Street and Stewart Avenue.
Pittsburgh—1501-2 Park Building.
Portland, Ore.—309 McKay Building.

Chollar's System of Gas Purification.

THE PURIFIED GAS REVIVES THE FOULED OXIDE.

BELT CONVEYORS

EQUIPPED WITH

BALL BEARING ROLLS

ARE THE BEST,

because they possess greater efficiency, consume less power, and the belts last longer than when any other type of roll is employed.

PLANS AND ESTIMATES FURNISHED ON REQUEST.

The Link-Belt Machinery Co.

Link-Belt Engineering Co. Philadelphia Chicago. U.S.A.

AMERICAN METER CO.,

NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,

Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

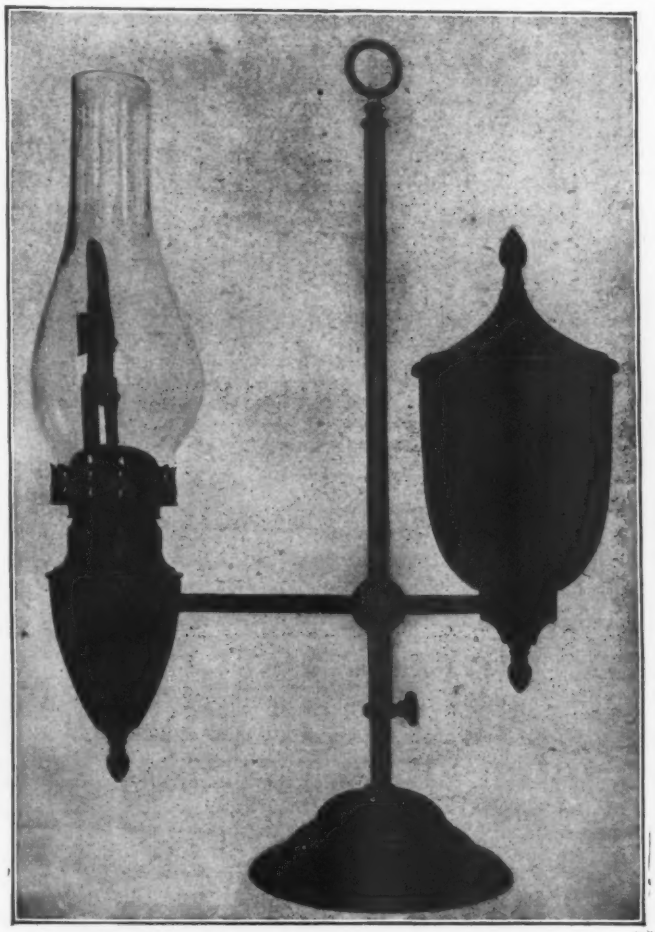
AUGUST, 1906.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.
Wed.	1	1.50 AM	4.00 AM
Thu.	2	2 50	4.00
Fri.	3	No L.	No L.
Sat.	4	No L. FM	No L.
Sun.	5	No L.	No L.
Mon.	6	7.40 PM	9.40 PM
Tue.	7	7.40	10.10
Wed.	8	7.40	10.40
Thu.	9	7.40	11.10
Fri.	10	7.40	11.40
Sat.	11	7.40 LQ	12.10 AM
Sun.	12	7.30	12.40
Mon.	13	7.30	1.20
Tue.	14	7.30	2.00
Wed.	15	7.30	2.50
Thu.	16	7.30	4.10
Fri.	17	7.30	4.10
Sat.	18	7.30	4.10
Sun	19	7.20 NM	4.20
Mon.	20	7.20	4.20
Tue.	21	7.20	4.20
Wed.	22	7.20	4.20
Thu.	23	7.20	4.20
Fri.	24	8.40	4.20
Sat.	25	9.20	4.20
Sun.	26	10.00 FQ	4.20
Mon.	27	10.50	4.20
Tue.	28	11.40	4.20
Wed.	29	12.40 AM	4.20
Thu.	30	1.40	4.20
Fri.	31	2.50	4.20

TOTAL HOURS DURING 1906.

By Table No. 1.

	Hrs.Min.
January	223.40
February	190.40
March	192.10
April	167.00
May	152.20
June	142.10
July	150.20
August	157.40
September	170.00
October	185.10
November	201.40
December	214.00
Total, yr.	2146.50



THE ELLIOTT KEROSENE STANDARD PHOTOMETER LAMP.

10-Candle Power.

This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

1st. It uses Standard Kerosene Oil (Pratt's Astral Oil or equivalent).

2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

AUGUST, 1906.

Day of Week.	Date.	Table No. 2. NEW YORK CITY. All Night Lighting. Light.	Extinguish.
		P. M.	A.M.
Wed.	1	7.10	3.30
Thu.	2	7.10	3.30
Fri.	3	7.10	3.30
Sat.	4	7.10	3.30
Sun.	5	7.10	3.30
Mon.	6	7.10	3.45
Tue.	7	7.10	3.45
Wed.	8	7.10	3.45
Thu.	9	7.10	3.45
Fri.	10	7.10	3.45
Sat.	11	7.10	3.45
Sun.	12	7.10	3.45
Mon.	13	6.55	4.00
Tue.	14	6.55	4.00
Wed.	15	6.55	4.00
Thu.	16	6.55	4.00
Fri.	17	6.55	4.00
Sat.	18	6.55	4.00
Sun.	19	6.55	4.00
Mon.	20	6.45	4.10
Tue.	21	6.45	4.10
Wed.	22	6.45	4.10
Thu.	23	6.45	4.10
Fri.	24	6.45	4.10
Sat.	25	6.45	4.10
Sun.	26	6.45	4.10
Mon.	27	6.30	4.20
Tue.	28	6.30	4.20
Wed.	29	6.30	4.20
Thu.	30	6.30	4.20
Fri.	31	6.30	4.20

TOTAL HOURS DURING 1906.

By Table No. 2.

	Hrs.Min.
January	423.20
February	355.25
March	355.35
April	298.50
May	264.50
June	234.25
July	243.45
August	280.25
September	321.15
October	374.30
November	401.40
December	433.45
Total, yr.	3987.45

NEW YORK, 318 West 42d Street.
BOSTON, 820 Beacon Building.
PHILADELPHIA, Broad and Arch Streets.
ST. LOUIS, 712 Roe Building.
CHICAGO, 218 La Salle Street.
SAN FRANCISCO, 512 Oak Street.

WELSBACH STREET LIGHTING COMPANY

....OF AMERICA....

No. 36.

Controls and Operates the **Welsbach System of Street Lighting,**

Which includes its specially DESIGNED and PATENTED BURNER for PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.

No. 38.

THE NEW NO. 7 WELSBACH DINING ROOM FIXTURE.

PRICE, EACH, COMPLETE, WITH SHADE, FRINGE, MANTLE AND CHIMNEY, $14. PER DOZ., $150. DISCOUNT, 50 PER CT.

Standard Length, 30 inches.
The New No. 7 Welsbach Dining Room Fixture, when ordered, will be sent complete, as follows:

1 No. 7 Harp Fixture and Brass Crown finished in Brushed Brass.
1 No. 66 Welsbach Burner (high candle power).
1 No. 4 Pilot By-pass.
1 No. 4197 Mantle — Intensive Brand.
1 No. 306 Chimney (air hole).
1 Fourteen-inch GREEN Art Glass Shade, with six-inch Green Beaded Fringe.

VARIATIONS.

Finished in oxidized copper, oxidized brass, etc., 25 cents extra.

Shades in Ruby and Green--Ruby, Amber and other colors, without extra charge.

Special colors require a few days extra time to fill orders.

Green Shades will be shipped unless otherwise ordered.

This fixture is being largely used by Gas Companies as a dining room fixture at the popular retail price of $10 complete, and is a great favorite for moderate sized two and three-story residences. In popularity and price it is unequalled.

WELSBACH CO.,
Salesrooms in All the Principal Cities of the United States.
Factories:
GLOUCESTER, N. J.
CHICAGO, ILL.

THE UNITED GAS IMPROVEMENT COMPANY

For the Six Months Ending July 1st, 1906, has been Awarded Contracts for 25 Sets of

Standard Double-Superheater Lowe Water Gas Apparatus.

PARTIAL LIST OF PLACES:

New Britain, Conn. (2d contract).	**Philadelphia, Pa.**	**Lewiston, Pa.**
Malden, Mass. (3d contract).	**Waterbury, Conn.**	**Greenville, Tex.**
Kirksville, Mo.	**Manchester, N. H.**	**New York,** Cent. Un. (3d contract).
St. Johnsbury, Vt.	**Allentown, Pa.**	**Jefferson City, Mo.**
Memphis, Tenn. (2d contract).	**Omaha, Neb.**	**Peekskill, N. Y.** (2d contract).
Council Bluffs, Ia. (2d contract).	**Muskegon, Mich.**	**Waterville, Me.**
Seattle, Wash. (2d contract).	**Nazareth, Pa.** (2d contract).	**Washington, D. C.** (3d contract).

TOTAL SETS TO JULY 1, 1906, = = = = = 618

TOTAL DAILY CAPACITY TO JULY 1, 1906, 488,930,000 CUBIC FEET.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

Established 1858. Incorporated 1890.
CHAS. E. GREGORY, Prest. DAVID R. DALY, V.-Prest. & Treas.
H. D. ABERNETHY, Sec.

J. H. Gautier & Co.

Greene & Essex Streets,
Jersey City, N. J.

MANUFACTURERS OF

CLAY GAS RETORTS, FIRE CLAY TILES,
FIRE BRICK and FIRE CLAY SPECIALTIES.

Ground Fire Clay, Fire Sand and Ground Fire Brick in Barrels and Bulk.

SOLE MANUFACTURERS OF THE

FLEMMING GENERATOR GAS FURNACE

Brooklyn Fire Brick Works,

OFFICE AND WORKS:
88 VAN DYKE ST., BROOKLYN, N. Y.
MANUFACTURERS OF
CLAY GAS RETORTS & SETTINGS, GENERATOR LININGS. SPECIALTIES.

L. C. HAMLINK, PRES. & GEN. MGR. AUGUST COURT, SEC'Y & TREAS.

ST. LOUIS GAS CONSTRUCTION CO.,

DESIGNERS AND BUILDERS OF

"BETTER **COAL GAS BENCHES,** BENCHES."

SPECIAL HIGH GRADE REFRACTORY MATERIAL FOR BENCH SETTINGS AND WATER GAS LININGS,

SOLE AGENTS FOR

CHRISTY SETTINGS.

ST. LOUIS, MO.

STANLEY'S CELEBRATED FIRE CEMENT

For the Repair of Clay and Iron Retorts & Firebrick Work, for the Protection of Ironwork when Exposed to a High Degree of Heat, and Excellent for Mouthpiece Joints.

In General Use in the United States and Canada.
Unlike Expensive Preparations,
THERE IS ABSOLUTELY NO WASTE.
F. W. STANLEY,
150 Nassau St., New York, N. Y.

Established 1846.
ALBERT J. WEBER, President and General Manager.

Adam Weber Sons.

Manhattan Fire Brick and Enameled Fire Clay Retort Works.

Works at Weber, on the Raritan River. Middlesex County, New Jersey.

GENERAL OFFICES:
Park Row Building, New York City.

ALBERT J. WEBER CONSTRUCTION

Modern Coal Gas Benches,

With either Horizontal or Vertical Retorts, Half-Depth and Full-Depth Recuperative Furnaces.

ADAM WEBER PATENTS

STANDARD BENCH IRONWORK.

Linings for Water Gas Apparatus, High Grade Fire Brick of All Shapes and Sizes, Ground Fire Clay, Ground Fire Brick in Bulk or in Barrels.

ISAAC C. BAXTER, President.
Works,
LOCKPORT STATION, PA.

ESTABLISHED 1864.

JAMES GARDNER, JR., CO.,

Successor to WILLIAM GARDNER & SON.

PETER YOUNG, Secretary and Treas.
Address all communications to
JAMES GARDNER, JR., CO., Room 202 Lewis Bldg.,
PITTSBURGH, PA.

Fire Clay Goods for Gas Works.

ESTABLISHED 1868.
L. N. RANCKE, Vice-Pres. & Mgr. F. SCHIAFFINO, Sec'y & Treas.

BALTIMORE RETORT & FIREBRICK CO.

BALTIMORE, MD.,

Manufacturers of all Material for the Construction of Coal Gas Benches.

HALF AND FULL DEPTH AND FREE FIRING BENCHES,

All styles of which we have in operation, equipped with the BEST of LATEST IMPROVEMENTS, proving our claim for SUPERIOR QUALITY and EFFICIENCY.

INCLINES—We have in SUCCESSFUL OPERATION benches of Inclined Retorts, MANUFACTURED and ERECTED by us.

WALDO BROS., 102 MILK ST., BOSTON, MASS.,
Agents for New England States.

LARGE FACILITIES—Correspondence Solicited.
RAIL and WATER CONNECTIONS to ALL POINTS.

NATIONAL PYROGRANIT COMPANY,

MANUFACTURERS OF

Fire Brick, Tiles, Special Shapes, etc.

NEW YORK OFFICE:
17 Battery Place, New York.

WORKS:
South River, N. J.

ESTABLISHED 1856.

HENRY MAURER & SON,
Manufacturers of

High Grade Firebrick, Blocks, Tiles,
ETC.,

Works: Maurer, N. J. Office: 420 E. 23d St., N. Y. City.

GEROULD'S IMPROVED RETORT CEMENT.

A Cement of great value for patching retorts, putting on mouthpieces, making up all bench-work joints, lining blast furnaces and cupolas. This cement is mixed ready for use. Economic and thorough in its work. Fully warranted to stick.

Price List, f.o.b. PITTSBURGH, PA.
In Casks, 400 to 800 pounds, at 5 cents per pound.
In Kegs, 100 to 200 " " 6 " "
In Kegs less than 100 " " 7 " "

C. L. GEROULD,
1200 Bank for Savings Bldg., Pittsburgh, Pa.

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An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland. Being the 37th year of publication. Compiled and arranged by JOHN W. FIELD, Sec'y and Gen. Mgr. of The Gas Light and Coke Company, London. Price, $5. For Sale by

A. M. CALLENDER & CO., 42 Pine St., New York City.

JOHN DELL,
President and General Manager.

MISSOURI FIRE BRICK CO.,

ESTABLISHED 1882.

MANUFACTURERS OF

Gas Retorts, Bench Settings, Fire Brick, Cupola Linings, Etc.

We are the **Exclusive Agents** *for the* **Mitchell Patent Benches,** *Constructed with Half or Full Depth Furnaces, to Burn either Coal or Coke, and Arranged for Front or* **Rear Clinkering.** *The* **Mitchell** *is the* **Original Coal Firing Bench.** *We also Erect Plain Benches with* **One** *to* **Six Retorts.**

YOUR CORRESPONDENCE IS RESPECTFULLY SOLICITED.

City Office: *411 Olive Street, Continental Bank,* ST. LOUIS, MO.

Bronder Patent Stoking Machinery.

Three-Scoop and Three-Rake Charging and Discharging Machines are operating in New York, Newark, N. J., Philadelphia, Worcester, Mass., Mt. Vernon, N. Y., Toronto and Montreal, Canada.

Four-Scoop and Four-Rake Charging and Discharging Machines are operating in Detroit, Mich.

These are the only machines that will draw or charge simultaneously 3 or 4 retorts (vertically) and handle from 42 to 60 retorts in from 25 to 30 minutes, lid opening and closing and filling of furnaces included.

Hot Coke Conveyor, Quencher and Steam Exhauster, operating in Toronto, Canada, working in water-sealed flue, rollers being protected from heat and grit.

COAL CRUSHERS, CONVEYORS AND BINS. TURNTABLES FOR MACHINES.

Labor-Saving Machines for Handling Coal and Coke from Coal Cars to Coke Yard or Bins, a Specialty.

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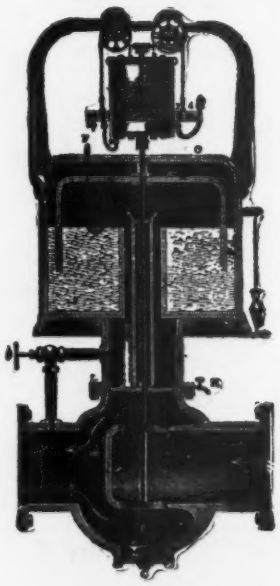
CONNELLY IRON SPONGE AND GOVERNOR CO.,



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COAL OR WATER GAS PLANTS,

Automatic, Balance, High Pressure and Service Governors,

Roots Improved Gas Exhausters,

Iron Sponge, Purifying Material for Gas Purification, Jones Jet Photometers, Pressure Registers, etc.,

INSTALLATION OF SMOKELESS TAR BURNING SYSTEM.

Reinforced Concrete Construction for all Purposes.

Wide Experience in High Pressure Installation and Extension,

GAS SPECIALTIES.

395 Broadway, NEW YORK.

295 West 22d Street, CHICAGO, ILLS.

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OAK HILL GAS RETORT AND FIREBRICK WORKS.

ST. LOUIS OFFICE: 417 Pine Street. NEW YORK OFFICE: Aldrich Court, 45 Broadway.

WE MAKE A SPECIALTY OF WATER GAS LININGS AND CHECKER BRICK.

Half and Full Depth Benches of Our Own Design, Containing 6, 8 or 9 Retorts.

SLOPERS.—We have perfected plans of INCLINED RETORT BENCHES, designed to meet conditions prevailing in America, and constructed entirely of American materials.

We Build Benches Complete. Ready for Gas Making. Also,

RETORT HOUSES,

COAL and COKE CONVEYING MACHINERY.

Plans, Specifications and Estimates Cheerfully Furnished.

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ALL CONTRACTS MADE AS OF ST. LOUIS, MO.

Gold Medals awarded by the Louisiana Purchase Exposition at St. Louis, for fireclay gas retorts, gas retort benches, firebrick and setting tiles.

Newbigging's Handbook for Gas Engineers and Managers.

Price, $6.50. For Sale by A. M. Callender & Co., 42 Pine St., N. Y. City.

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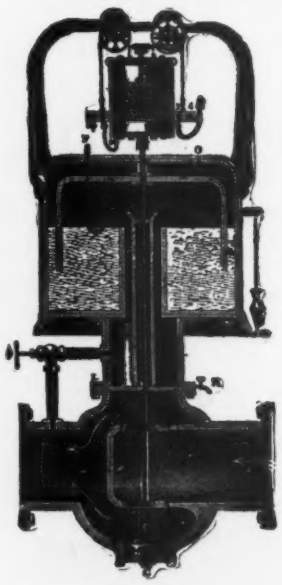

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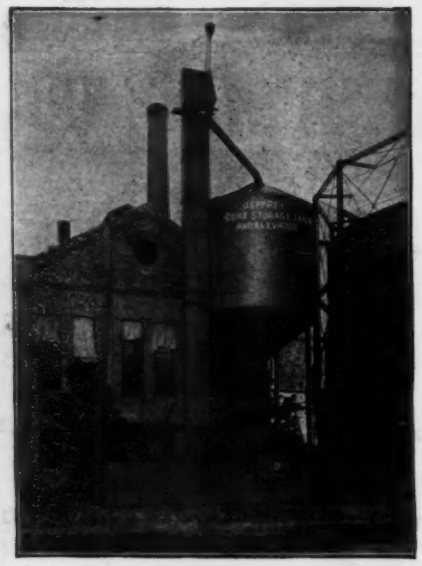

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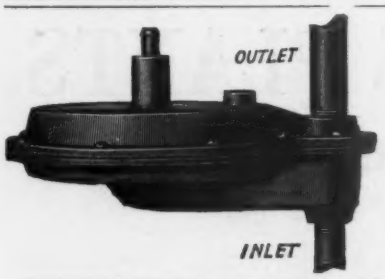

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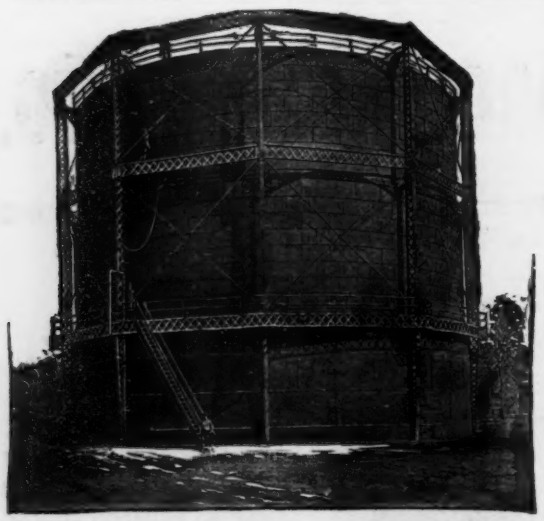

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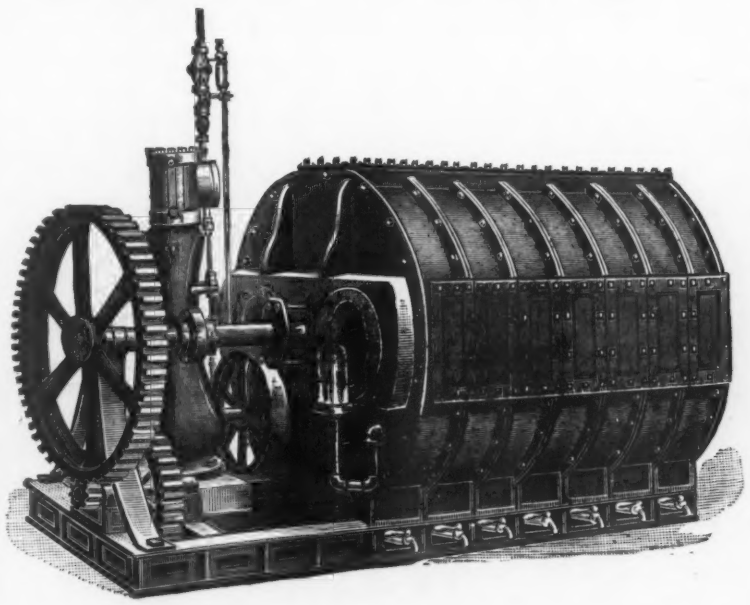

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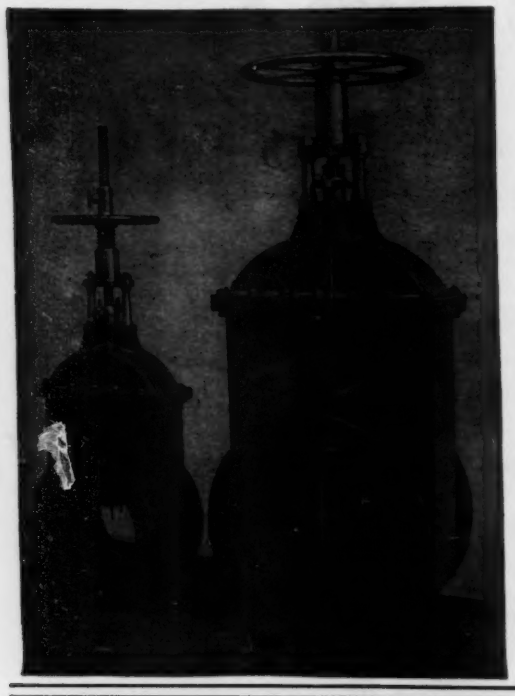

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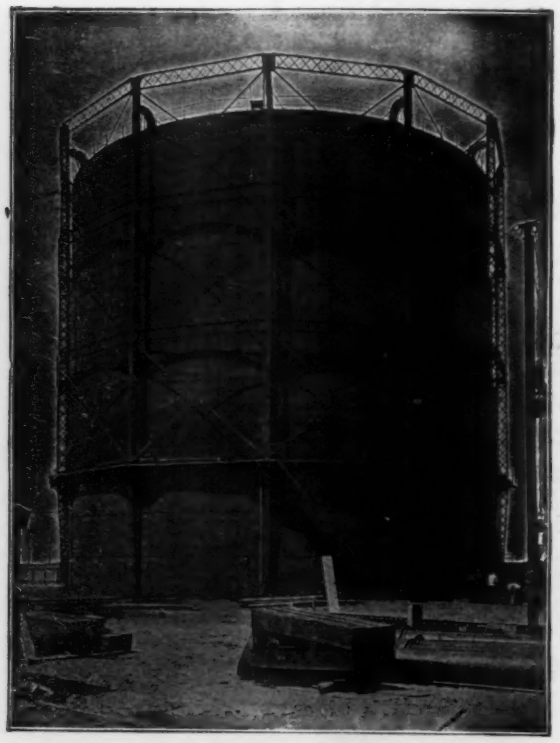

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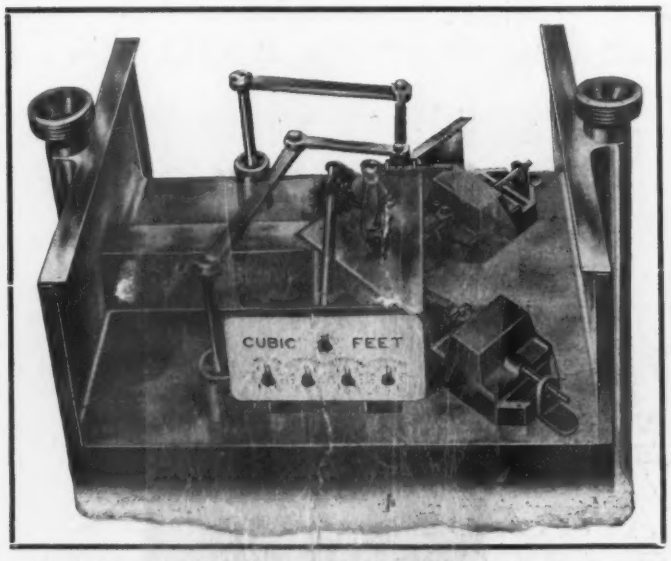

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